

Exclusive Contributions

A Study of the Maxillae with Regard to Their Blood and Lymph Supply.	JOHN BETHUNE STEIN, M.D.	649
What Causes the Dentin to be Sensitive?	C. F. KABELL, D.D.S.	665

Orthodontia

Early Treatment in the Correction of Malocclusion of the Teeth.	D. WILLARD FLINT, D.D.S.	668
Discussion of Dr. Flint's Paper		680
What Can Oral Prophylaxis and Orthodontia do for Each Other?	N. S. HOFF, D.D.S.	684
Discussion		691

Prosthodontia

The Truth on the Straight Occlusal Line, Falsely Attributed by Choquet to Tomes.	DR. OSCAR AMOEDO	693
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Society Papers

President's Address, New Jersey State Dental Society.	WALTER WOOLSEY, D.D.S.	697
Ethyl Chlorid vs. Nitrous Oxid.	MAURICE GREEN, D.D.S.	701
Codrenin as a Local Anesthetic.	C. C. MILLER, D.D.S.	705

CONTENTS—Continued

Editorial

Reorganization Proposed for the National Dental Association	709
Proposed Constitution of the National Dental Association	711

Correspondence

Tin and Gold.	
C. EDMUND KELLS	725
Correction.	
F. H. NIES	726

Society Announcements

National Society Meetings	727
State Society Meetings	727
Illinois State Dental Society	728
The Northern Dental Association	728

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A Study of the Maxillæ with Regard to Their Blood and Lymph Supply.

By JOHN BETHUNE STEIN, M.D.

Professor of Physiology and Histology, New York College of Dentistry.

Professor of Physiology, Veterinary Department New York University.

For a long time the mandible, maxillæ and intermaxillary bones have excited study. No less a one than the author of "Faust," the naturalist Goethe, whose theory of evolution antedated the Darwinian, discovered the intermaxillary bones in man.*

They were known to exist as separate and distinct structures in all mammalia and to be readily separated as such, not only from each other, but also from the maxillæ proper. In man, however, and to some extent in monkeys (Figs. 1, 2 and 3), as development advances, they unite with the maxillæ, so that all vestige of their primitive condition as units in the formation of the cavity is lost; in fact, in many instances the line of suture between them and the maxillæ disappears.

The discovery of these intermaxillary bones was made by Goethe through his knowledge of comparative morphology; it had shown him that they existed as such in mammals, and he therefore sought them in man, and his findings were according to his supposition. When one

* Sammtliche Werke. Band 6, Osteologie, s. 65.



FIG. 1.



FIG. 2.

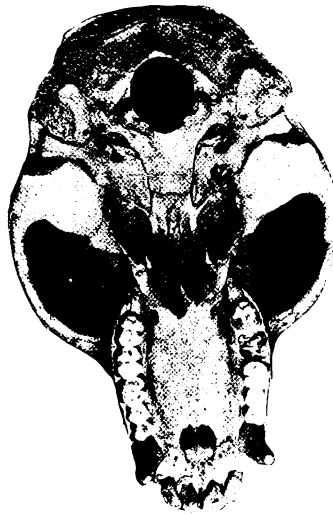


FIG. 3.

FIGS. 1, 2, 3.

Macacus Radiatus. Three views of the intermaxillary bones.

looks at a skull he may be tempted to say, "Alas! poor Yorick," but certain landmarks upon it will make him think of Dr. Faust, the creator of him, and that Faust and Goethe, according to the story, were one. Let us stop a while and examine these parts as he did. If we observe carefully the inner surface of the so-called maxillæ from the median line to the alveolar border of the bone, in many instances, we shall be able to find a



FIG. 4.

Maxillæ of child and adult. The intermaxillary bones are distinctly seen in the former specimen. Their identity is lost in the latter.

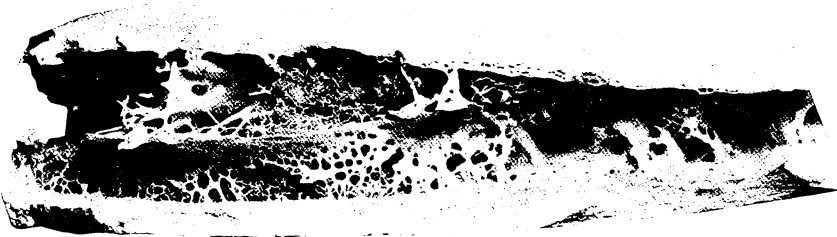


FIG. 5.

Horizontal section of mandible of an ox, looking toward the roof of the mandibular canal (below) and the coarse and fine trabeculæ of cancellous bone (above). In places the extremely delicate trabeculæ is lost.

suture running downward and outward, starting from the anterior palatine foramen and terminating at the alveolar margin outside of the lateral incisor (Fig. 4). This line forms the outer demarcation of the intermaxillary bones in man; they hold the incisor teeth, and in the embryo we have a distinction between the true maxillary bones and the intermaxillary; later on in life the line of juxtaposition of the latter forms the so-called intermaxillary suture.

The observations and revelations by Goethe regarding the true duality (not separate centers of ossification) of our so-called maxillæ, might lead one to ask himself the question, "What are the maxillæ, and how are we to study them?"

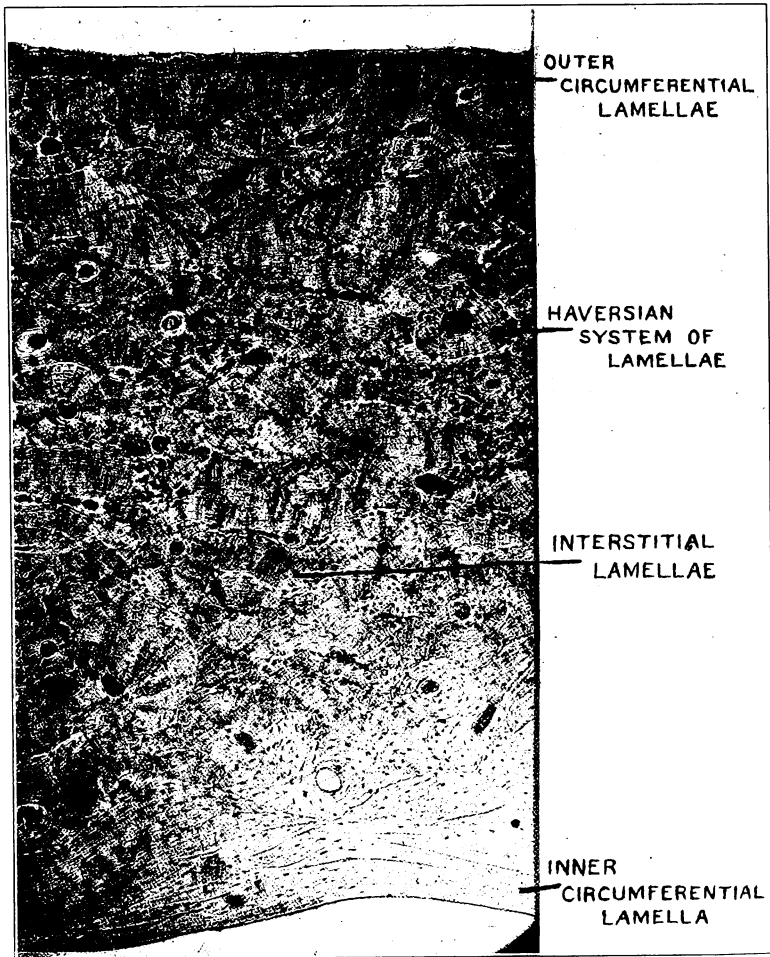


FIG. 6.

Transverse section of human radius, showing the several systems of lamellæ, with their lacunæ and canaliculi. Specimen ground thinner at bottom than top.

We must, in the first instance, define exactly what we mean by the maxillæ. The term is to be applied to all the several parts of these bones; the bony structure, both gross and microscopic; the structures within and without the casement of bone, the teeth and finally the circulatory fluids, both blood and lymph.

In the study of the maxillæ and mandible, we have been taught to know them and the several parts as entities, not looking at the reciprocal and complemental relations existing; and therefore our knowledge of a pathological condition in or about the parts is limited, as a rule, to a particular part, and we cannot follow or understand the vicious circle excited by the injured structure. An injured tooth, the loss of a tooth, injury to the bone or structures within or outside of it, affect not alone



FIG. 7.

Longitudinal section of bone, showing branching and anastomosing Haversian canals. Lacunæ and canaliculi not so well seen.

the part, as all clinicians well know, but very distant parts; in fact, all within the ring in which the reaction to the injury took place. The cellular altruism here expressed is of the highest; if one part staggers or falls, the whole joins the part in that act and a more or less reciprocal sacrifice takes place. Are we in the habit of looking upon the maxillary bones and soft parts as portions of the teeth and *vice versa*? The relations are not often considered, except by the thoughtful and skilled. It is necessary for us to recognize the reciprocal kinship between the several parts involved, not only in their mature condition but also during their formation and development, and as this has not been brought out as clearly as it might in the text books on anatomy, physiology and histology,

we shall first of all, in taking up the study of the parts, look at the bony matrix, minus the teeth and all the other complemental structures of the jaws.

No one doubts the general knowledge possessed by most clinicians regarding the gross anatomy of the maxillæ, and even a more or less definite idea regarding the microscopic picture of bone; but few have brought the sum of these two to a point where they know the real appearance of the alveolus and the bony structure underlying the same.



FIG. 8.

Microscopic section of delicate cancellous bone with marrow, made from a decalcified part of Fig. 5, 18 microns thick. Trabeculae cut transversely and longitudinally. Lamellæ are parallel with long axis of the mass. Bone cells seen in lacunæ.

It is important that we thoroughly understand the anatomical relations of structures involved in the construction of the above named bony parts, before we can pass to the study of the complemental soft parts and teeth.

The study of many of our specimens will be one of an arbitrary character, of a tissue which, *per se*, does not exist; it is only a framework of the bone that we shall look at. When we study bone we should keep in mind the ontogeny of the organism and particularly the process of differentiation in the tissue under observation, as well as the bone cells with their branches lying within the bone lacunæ and canaliculi, the periosteum, endosteum, and medulla; that they are the essential structures, the hard part being the intercellular substance, and the proof of this fact is demonstrated in the formation of the tissue, and in the case of fracture in its regeneration. The process of differentiation and physiological

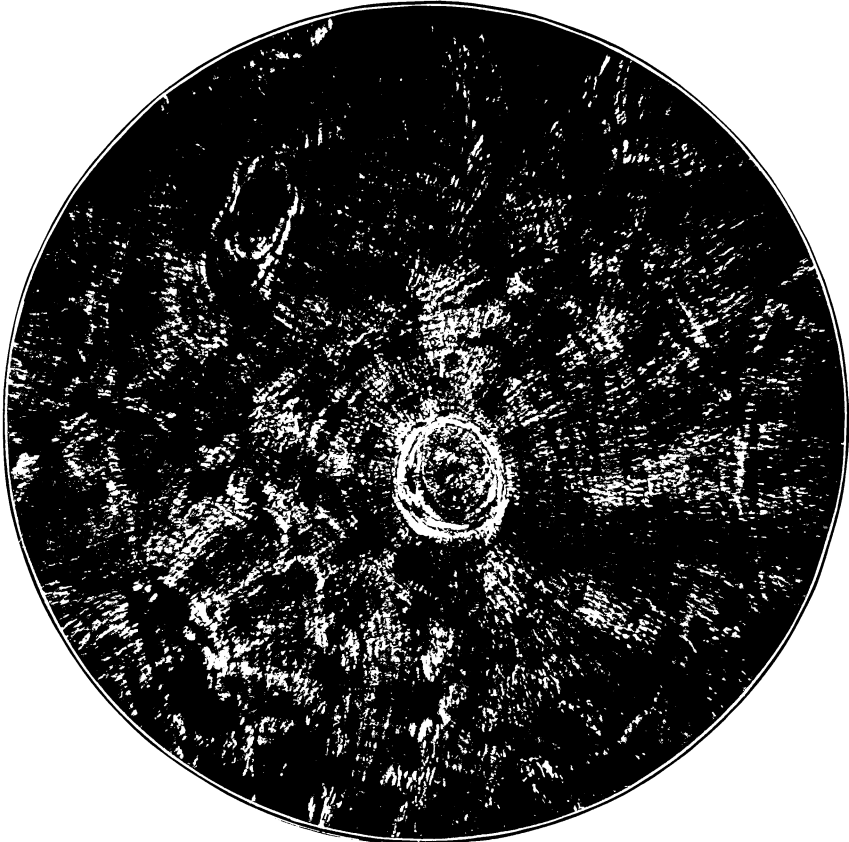


FIG. 9.

Bone showing Haversian system of lamellæ, interstitial lamellæ, lacunæ and canaliculi. High power picture of a part of Fig. 6 (general focus).

division of labor in cells demonstrates how the bone is formed, and it has been shown by Wieder* that the various elements, viz., periosteum, cortex, endosteum and medulla, assist in the process of bone regeneration; that their activities are reciprocal and the absence of one element is compensated for by the remainder.

En passant, and for further reference, let us briefly review some trite points regarding the histology of bone.

* University of Pennsylvania Medical Bulletin, Vol. XX, Nos. 7, 8, 9. Regeneration of Bone. by Henry S. Wieder, M.S.

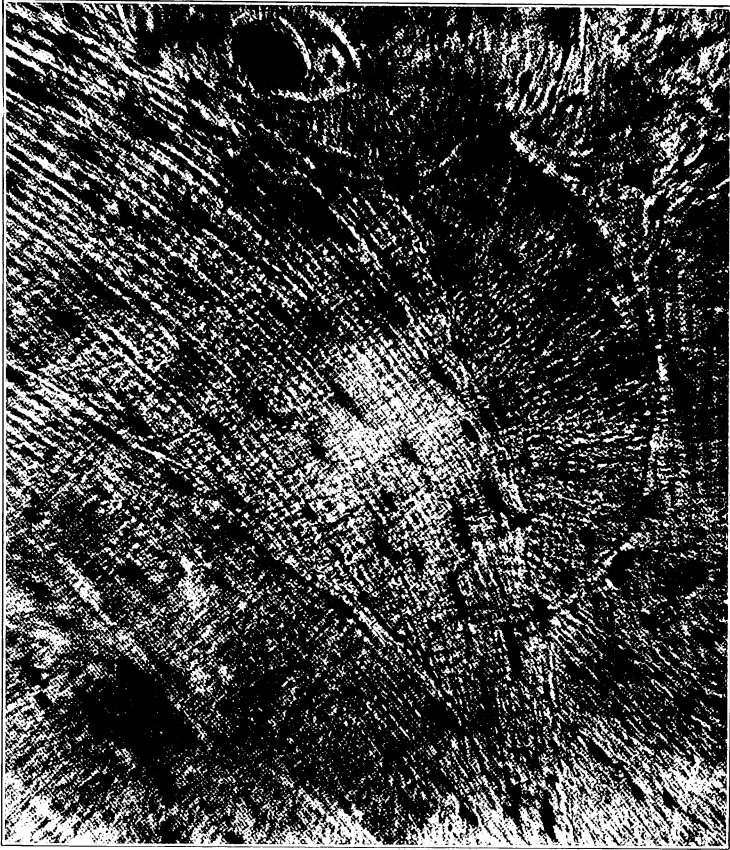


FIG. 10.

Lamellæ (circumferential) alternate dark and light lines, due to the direction of the fibers of the lamellæ.

Histology of Bone.

- 1.—Bone is differentiated from a part of the mesoderm (mesenchyme).
- 2.—We distinguish a compact part (cortex) and a spongy or cancellous portion; the latter holds in its meshes the bone marrow. (Fig. 5.)
- 3.—The intercellular substance is laid down in lamellæ. These consist of parallel fibrillæ (transformed connective tissue fibrils). (Fig. 10.) The fibrils yield gelatin. The calcium salts are closely connected with the organic part (Ossein). Some regard the inorganic matter as between



FIG. 11.

Lacunæ with anastomosing canaliculi. (High magnification.)

ITEMS OF INTEREST

the fibrils, others think that it is within them. The fibrils are held together by an interfibrillar cement substance forming bundles, and these bundles in turn are united by an interfascicular cement substance.

4.—In the cortex (Fig. 6) the lamellæ are grouped as follows:

(a) Outer circumferential (concentrically arranged around the bone) lamellæ, which is pierced by canals, among them the canals of Volkmann. This layer is covered by periosteum.

(b) Inner circumferential lamellæ (arranged concentrically around the inside of the cortex), inside of which is the endosteum.

(c) Haversian systems of lamellæ, which are arranged concentrically around the Haversian canals. The canals run parallel with the long axis of the bone and are connected by transverse ones. Thus a system of canals is formed. (See Fig. 7.)

(d) Interstitial lamellæ; they are:

(1) False, or remnants of Haversian systems of lamellæ, wedged in between the Haversian systems of lamellæ.

(2) True, or those parallel to the circumferential lamellæ.

(e) The different systems of lamellæ are joined together by a cement substance.

5.—Fibers (Sharpey's), partly calcified and non-calcified, pass into the outer circumferential lamellæ from the periosteum. Elastic fibers often run along with them.

6.—In spongy bone (see Fig. 8), the lamellæ are parallel with the long axis of the mass. There are no systems of lamellæ. No Haversian canals.

7.—Spaces (lacunæ) (see Figs. 6, 7, 9, 10 and 11) with branching processes (canaliculi) lie between the lamellæ. They contain the bone cells with their branching processes. The canaliculi communicate with adjacent and distant canaliculi. They pass to Haversian canals and outer and inner surface of bone. By their anastomosis, there is a canal system formed, consisting of Haversian canals, lacunæ and canaliculi, and continuity is established between the outside and inside of the bone.

8.—Blood vessels and nerves enter and leave the bones by way of the large foramina and Volkmann's canals.

9.—Lymph spaces in the periosteum and endosteum communicate with the pericellular lymph spaces in the canaliculi and lacunæ and the lymph circulates through this tissue bathing the bone cells in the lacunæ and their cytoplasmic processes in the canaliculi. *The lymph probably flows in the direction of the Haversian systems, into the perivascular canals or lymph spaces which surround the blood vessels in the Haversian canals.* The Haversian canals contain a vein or artery, sometimes both.

The *tunica extima* of one or both these structures is covered by endothelium, the Haversian canals are lined with endothelial cells, and stretching across this space from vessel wall, to wall of Haversian canal, are connective tissue trabeculae, which are also covered with endothelium. This limited zonule forms the so-called perivascular canal, or the perivascular spaces, and is a part of the lymph vascular system.

10.—Medulla (Marrow).

(a) Yellow, mostly fat, with some true marrow.

(b) Red, true, is made up of fibrous connective tissue, reticulum and marrow cells.

The cells are:



FIG. 12.



FIG. 13.



FIG. 14.

- (1) Myelocytes.
- (2) Eosinophile.
- (3) Nucleated and non-nucleated erythrocytes.
- (4) Mast cells.
- (5) Myeloplaxes (giant cells) among which are the osteoclasts.
- (6) Fat cells.
- (7) Osteoblasts. (The latter are usually, but not always, found in the deeper layer of the periosteum.)

Our specimens were made almost entirely from the human subject; a few from the bovine. We have not attempted to make the findings suit the theory by showing only selected and desirable specimens, but we present typical ones, exhibiting the characteristics of a fair number of maxillae which were obtained at random, when and where we could get them. Sections were made by means of a fine saw, in the transverse, longitudinal and, in a few cases, oblique direction. The bones were boiled in a strong sodium carbonate solution, afterward placed in chloroform and ether to extract the fat; then bleached by means of hydrogen peroxid.

ITEMS OF INTEREST

The tissue subjected to this process, for a period of several months, finally left us what we might call the skeleton of bone, practically, if not entirely, devoid of organic matter, except the organic calcium compound, if such is the combination. A white, hard, and, when dried, an extremely brittle substance was obtained, which showed to the naked eye, and better by means of a magnifying glass, spaces, apertures, and foramina, many of which previous to this treatment could not be seen at all, or only indifferently.



FIG. 15.



FIG. 16.

The bony cortex appears almost like ivory; coarse trabeculae run from it in every conceivable direction, and from these spring forth finer branches terminating in fine fibers, which in thick sections form an extremely fine network. These interlacing fibers *en masse* looked like spun candy (Fig. 5), so delicate, that during the preparation of the specimen in most places they were washed away with the organic matter and dissolved fat. The specimen Fig 12 shows our line of section through the symphysis mandibulae; also where, from above downward, we cut through the center of the alveolus which lodged each central incisor.

In Fig. 13 we have separated the parts of the specimen Fig. 12, and we see in the upper part foramina which connect the two alveoli; we see in the middle part the cancellous bone in the interalveolar wall, and finally below we observe the spongy bone of the body of the mandible.

Fig. 14 shows an alveolar view of each section of the median wall of the alveoli. In the left specimen at its upper and lower part are seen numerous foramina; the former pass into the adjoining alveolus, the latter into the cancellous bone in the common alveolar wall. Little of the floor is seen, the section passing directly through its center; but there is

evidence of continuity of alveolus and the spaces in the underlying cancellated bone. In the specimen to the right, the section does not pass directly through the center of the floor of the alveolus and the wall appears more compact. Nevertheless, what is seen of the floor from above shows it to be studded with minute holes, especially is this so if we use a magnifying glass. The above also holds good for the wall, which in the picture appears homogeneous, whereas with the glass it is seen to contain numerous openings. I might state here that almost all our pic-

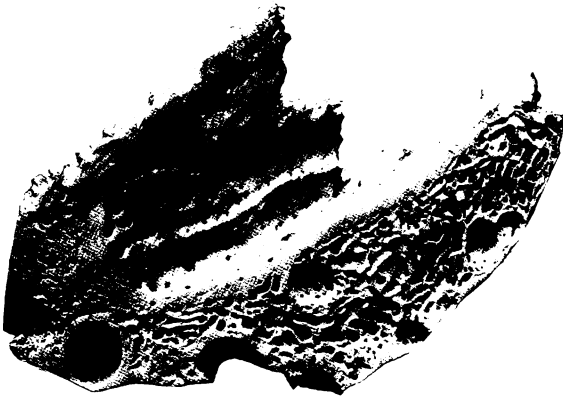


FIG. 17.

tures give us only one phase of what we desire to show; that to see and read the real truth, one must see the specimen itself, and this applies as much to the gross as to the microscopic picture. As the structures we desired to show in our photo-micrographs and photographs were often not in the same plane, we endeavored to obtain as good a picture as possible by a general focus, rather than by focusing on some particular part of the specimen.

Fig. 15 shows the lateral view of the walls and part of the floor of the alveoli of the first and second molars. Notice the cribriform condition of the walls and floor, as well as the foramen (upper part of right alveolus) opening into the alveolus from without; also the relation of the floor to the underlying cancellous bone and mental foramen.

We see in Fig. 16 (superior maxilla) the sieve-like condition of the floors and walls of the alveoli extremely well shown. Fig. 17 shows floors of four and portions of three other alveoli. Note how the floors of the alveoli seem to almost merge into the surrounding cancellous bone. Examine also the numerous foramina perforating the palatal alveolar

ITEMS OF INTEREST

wall of the bony cortex; also the absence of alveolar wall. We look down, in Fig. 18, upon the interalveolar septum; the bristles pass through foramina connecting two adjacent alveoli; also through those leading into adjacent or subjacent cancellous bone. Fig. 19 is the same as Fig. 18, but seen from below. The bristles are seen passing into the spongy part of the bone.

To be seen in Fig. 20 are seven transverse sections of two alveoli



FIG. 18.



FIG. 20.



FIG. 19.

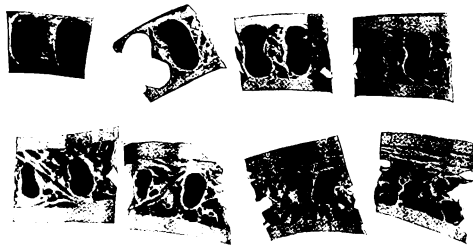


FIG. 21.

(mandible). The first (upper left hand) was made at about the upper third of the alveolus, the last (lower right hand) shows the floor; the floors of both are on the same level. The cortex is evident as is also the coarser bone, trabeculae, which form a fine lattice work. The extremely delicate spongy bone, which we saw in Fig. 5 and in microscopic section in Fig. 8, has been destroyed.

Fig. 21 is another series of sections of two alveoli (mandible) from above downward. The floor of the left alveolus is seen, in the seventh specimen of the series, to merge into the underlying surrounding cancellous bone; whereas the floor of the other alveolus is not seen until we arrive at the eighth specimen, about 2 mm. below (lower right hand

corner of picture). You will note the particularly beautiful open work in this specimen, resembling an oriental bizarre carving in ivory.

In Figs. 22, 23 and 24, we see serial antero-posterior sections of a mandible, which contains only two molars. If piled one on the other, in sequence, except the upper specimen in Fig. 24, which is the reverse side



FIG. 22.



FIG. 23.

of the lower specimen in Fig. 23, we would form that part of the mandible, extending from the symphysis, almost to the angle of the bone.

In the upper specimen, Fig. 22, two bristles are seen passing through the alveoli for the two incisors, then emerging beneath the first and entering foramina in the second specimen. They have passed through what was left of the floor of the alveoli of the upper specimen and are entering foramina in the lower, which are immediately below the floor of the alveoli, for in making our section, the saw passed through a plane corresponding with most of that of the floor of the alveoli.

ITEMS OF INTEREST

With the magnifying glass other foramina can be distinctly seen in the lower specimen in the neighborhood where the bristles enter. In the upper specimen another bristle passes from without, through a foramen in the cortex, into the alveolus for the first incisor. In the lower speci-



FIG. 24.

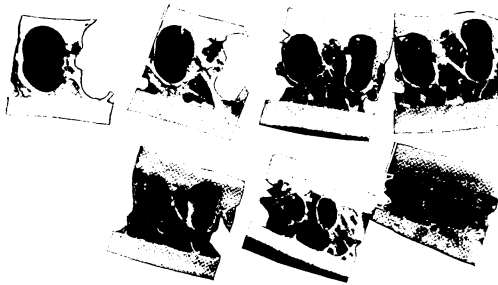


FIG. 25.

men a bristle also passes through a foramen from the outside to the inside of the alveolus for the canine.

In Fig. 23, upper specimen, is seen the floor of the alveolus of the first bicuspid. Sections of the alveoli for all the other teeth, except incisors and third molar, are also obvious. In the lower specimen are shown the floors of the canine, second bicuspid and two molar alveoli.

In Fig. 24, we observe that the upper specimen is the lower specimen of Fig. 23 reversed. We have passed a bristle through one of the fora-

mina in the floor of each alveolus, and we see it coming through and passing into the underlying cancellous tissue. The lower specimen leads us into a bony labyrinth.

In examining Fig. 25, you will note that the specimens of Fig. 20 are reversed and that we are now looking at their under surfaces. In the seventh specimen (lower right hand corner) we see the roof of a part of the mandibular canal (man) and that the floor of the two alveoli assist in the construction of the same, and finally the floor or roof, as the case may be, is perforated, so that continuity is established between canal and alveoli.

We shall reserve, however, for future discussion, the relation which the floors and walls of the alveoli bear toward the sub and adjacent parts of the maxillæ.

From a study of the foregoing specimens, it is possible for us to readily understand the probable situation of important structures, which carry the blood, lymph and nerve supply to the several parts of the maxillæ, as well as those which are engaged in their first formation, development, and in event of injury, their regeneration.

(To be continued.)

N. B.—I am indebted to Mr. John L. Peters for his assistance in preparing and photographing specimens.

What Causes the Dentin to be Sensitive.

By C. F. KABELL, D.D.S., Chicago, Ill.

The dentinal tubuli by the very minuteness of their size must have very strong capillary attraction, therefore, are necessarily filled with liquid, be it serum, nerve fluid, lymph or plain water.

In the healthy tooth these tubules will be entirely full, but through decay or operative measures, the exposed openings of the tubuli are subjected to atmospheric pressure, evaporation and the affinity of acids and alkali for water.

Let us first consider atmospheric pressure. If a capillary tube that has the capillary force to lift water ten feet is broken to the length of six inches, the water in this six inch tube will not run out of the opening but will sink a trifle in the tube, because the free opening is subjected to atmospheric pressure.

ITEMS OF INTEREST

This will happen in the dentinal tubes when cut by the drill; the volume of liquid in the cut tubuli will sink and exert a pressure on the protoplasm of the odontoblasts which penetrates thread-like into the other end of the tubuli.

This sudden shock is transmitted as pain by the nerve fibrils which are supplied to the odontoblasts.

As proof of this theory I mention:

1st. The very painful sensation when we drill at right angles to the tubuli, because we constantly irritate nerve fibrils through the sinking of the liquid in the tubules.

2d. When we drill parallel to the tubuli the procedure is less painful because we administer a succession of shocks to the same nerve endings, which lose their transmission power on account of the physiological fact that nerves easily grow tired and in that state will not respond any more to irritation.

The removal of decalcified dentin is painful because before its removal it closed the tubuli and the excavating exposes the tubuli to free atmospherical pressure.

Hot air causes pain by evaporating the liquid out of the tubuli. This loss its capillary attraction will seek to supply from intercellular liquid in the pulp chamber.

Changes of temperature by hot or cold water or fillings cause expansion or contraction of the intertubular liquid with the resultant fluctuation in volume.

Spunk, I think, causes pain by absorbing some of the liquid out of the tubuli, although its action can probably be explained in the following way: When moisture is covering all the tubular openings, it will be the chief source of supply for the dentinal tubuli, so that atmospheric pressure will not be felt very much, in the same way as a stream of blood-warm water directed against the field of operation will ease the pain of drilling.

On removing this moisture, the intercellular liquid is again called upon with resultant disturbances and pain.

Alcohol, acids and alkalis act in a similar manner by their affinity for water, thereby causing a replenishing from the liquid in the pulp chamber.

Here osmosis might play an important role after the first shock of the application, to explain their sometimes desensitizing action.

In preparing a tooth for crowning, I found the dentin so sensitive to grinding that I had to devitalize. I was lucky to open the pulp chamber quite freely and here the idea struck me to test this theory.

**Proofs of the
Theory.**

I reasoned that if atmospheric pressure were now directly supplied to the contents of the pulp chamber, it would counterbalance any action of the same force directed to the tubuli, and sure enough, the dentin which before would not bear any grinding could now easily be cut without any pain to the patient.

Another proof is the action of nitrate of silver; by mechanically closing the tubuli it materially reduces the pain of cavity preparation.

In order now to understand why such minute changes in the amount and movement of the intertubular liquid will effectively cause shock and resultant pain, we must assume that the protoplasm of the odontoblasts snugly fills the opening of the pulp chamber ends of the tubuli, an assumption we have to take for granted when we consider pressure anesthesia.

When we apply a concentrated solution of cocain to the dentin, hydrolytic action will set in and the amount of the cocain in the intertubular liquid will soon be equal to the remaining amount of the salt in the applied solution, and if the tubuli were not closed the intercellular liquid would soon have an equal quantity of cocain throughout the pulp chamber.

As a simple topical application has no perceptible effect, this assumption must be correct, and only by applying pressure do we mechanically open the tubuli and gain the desired result.

This last sentence I leave open to discussion because I am not sure whether the sluggishness of a strong cocain solution will have any part in dissensitization or what factors outside of chemical action might contribute to the result, but in my humble opinion, I claim that this theory explains pretty well the different phenomena of dentinal sensation and the effects of our different methods to overcome it.





Early Treatment in the Correction of Malocclusion of the Teeth.

By D. WILLARD FLINT, D.D.S., Pittsburg, Pa.

Read before the American Society of Orthodontists at Detroit, and repeated by request before the New Jersey State Dental Society.

Upon the importance of early treatment orthodontists all agree, and never was the old adage that "a stitch in time saves nine" more applicable. The fact is, we could all hope that our efforts might be preventive rather than corrective.

The general practitioner does not detect incipient malocclusion and there is always an indication which the trained eye of the specialist is quick to observe, therefore I believe every orthodontist is under obligations to the general practitioners to appear before them and impart some of the knowledge that he has received and the results of his experience. As Dr. Hoff has said, we ought to have "a burning message" and show the general practitioner how much deformity can be averted by doing the right thing at the right time. We ought to be on such good terms with our confreres that they would count it a pleasure to consult with us when in any case there is doubt as to the manner of procedure. How often mouths and faces are ruined for life simply because of an aching deciduous tooth, the mother asking for its removal, the dentist acquiescing and the child becoming the unknowing victim, and our cabinets of models tell many tales of arrested development, any and all of which might have been averted by proper care.

ORTHODONTIA

Importance of Teaching Orthodontia in College.

We are not doing our duty if we neglect the call to a chair in a dental college. We may not be able to afford the time from a pecuniary standpoint, but surely because of the great good it will do the mass of humanity we ought not to neglect such an opportunity of teaching the great principles of orthodontia.



FIG. 1.

Lateral occlusal and anterior views, showing normal interproximal spaces in a child of four and a half years of age.

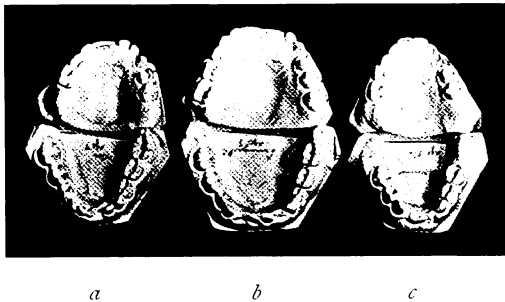


FIG. 2.

(a) Lack of development between deciduous cuspids in a child of seven years. (b) Normal development in a child of seven, showing contrast. (c) Lack of development due to an automobile accident, prematurely losing lower deciduous incisors.

We may have some difficulty in making the older practitioners believe all we claim, but the young men in school are there for the purpose of learning, and if we are true to our calling we surely can, by the use of hundreds of actual photographic slides, demonstrate the truths for which we stand. Let the students see and they will believe, and what better messengers of truth can we have than the army of new men graduating each year? The students *can* learn occlusion in school, and I say it emphatically; they can learn the value of a tooth, the absolute necessity

ITEMS OF INTEREST

of retaining all the deciduous teeth up to the time of their normal loss and replacement by the permanent teeth or the mechanical retention of the spaces of such deciduous teeth if any are lost prematurely.

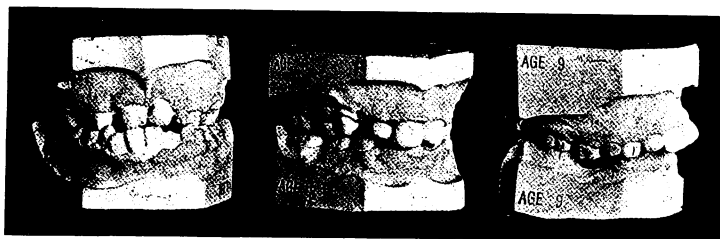
In one of our schools the senior class can give twelve reasons why the first, or principal molar should be retained at any cost; they know how to diagnose, which is second only to the great truth of a knowledge of occlusion; they know when to suspect pathological conditions in the nares from the teeth and facial expression; the possibilities of beautifying a



a *b* *c*

FIG. 3.

Anterior views of same three cases.



a *b* *c*

FIG. 4.

(*a*) Loss of all four premolars in lower arch; notice dropping back of lower incisors. (*b*) Loss of deciduous cuspids at eight years; notice overbite and distal movement of incisors. (*c*) Premature loss of deciduous lateral, permitting centrals to drop into lingual occlusion.

human face, and many other truths of like nature. The student can not get the practical clinical work in school, I admit. The teaching of any subject in any school never made any man proficient; it is practice only that accomplishes this. With this knowledge, are not these students infinitely better than if they were graduated without the knowledge which this chair can and does impart? If a man has a fondness and aptitude for the special work then let him take a post-graduate course, but by all means give him the chance to get knowledge of such principles of orthodontia as should be included in a dental curriculum, because he needs it at the beginning of his career.

ORTHODONTIA

Need of Early Treatment.

To the query "Why treat patients so young?" I would reply that it is more advantageous in every way. Prevention is always better than cure. I am glad the day has come when parents will not listen to the old anthem "Wait, wait!" but rather hearken to common sense arguments in favor of early interference. When does the physician treat

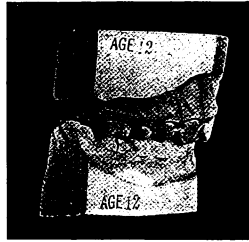


FIG. 5.

Loss through caries of mesial one-third of lower first molar.



FIG. 6.

The result in facial expression of fifth illustration.

spinal curvature, club foot, hare lip, and other deformities of children? When the children can "appreciate it," or when "pride asserts itself"? No! the earlier the better; and in orthodontia, some cases must be taken early if we are to accomplish perfect and permanent results. From Dr. Angle we learn that the deposition of bone around the roots of the teeth is far from complete even at the ages of twelve or thirteen, and that the sockets are much larger in early childhood. Then why not, in our corrective work, assist nature rather than wait until the second dentition is completed, and then tear down and have to resort to a secondary building

ITEMS OF INTEREST

up process. In other words, let us guide the teeth as they erupt into their proper places, and the deposition of bone around the roots of the teeth will be as nature first intended.

The cancellous nature of the bone and the less number of permanent teeth offer less resistance to arch expansion and the other like operations in early childhood, than after the completion of the second dentition, allowing shorter and painless methods of treatment, and finally, and principally, stimulating nature's own developmental processes.

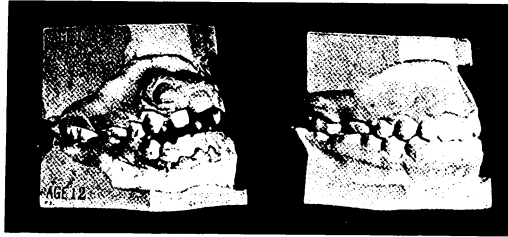


FIG. 7.
Lateral view—case of patient suffering from adenoids and enlarged tonsils.

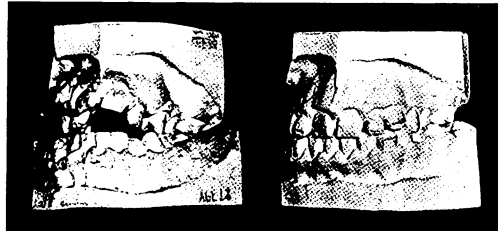


FIG. 8.
Anterior view of same case.

Tractability of Children.

With children we can do anything in the line of treatment. They never object to the conspicuousness of appliances, and their inconvenience is but trifling, while in older persons the pain is quite severe at times, even with all the precaution we can possibly take to alleviate the same, and however much we try to persuade ourselves that there is not much real pain. I have had some cases, patients over twenty years of age, where the work was to be done only on the assurance that the appliances could not be seen, and when occasion demanded, they had to be removable. You might argue that such patients do not want the work done very badly, or they would endure this inconvenience, but I disagree, and knowing what I do I would have desired the same kind of service which they received.

ORTHODONTIA

Objections to Early Treatment.

In extensive cases of malocclusion in the young it is quite natural to find some obstacles in the way of treatment. If the patient had to have appliances in the mouth continuously there certainly would be an objection because of the great care that must be given those mouths to avoid inviting early decay. But this work should never be continuously performed; rather what is most necessary at a given time, retaining the same, and waiting for development; then if any other interference should appear necessary as development progresses it should be attended to.

I do not believe that in all cases of malocclusion in the deciduous den-

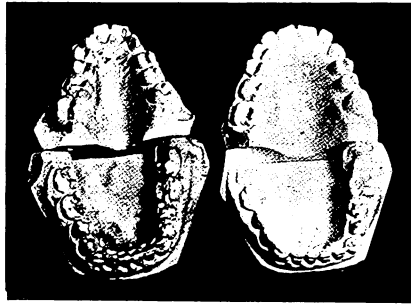


FIG. 9.
Occlusal view showing expansion.

tition it is necessary to interfere, but surely in all cases where there is lack of anterior development or inharmony in the dental arches, as in Class II, Division 1 (Angle classification) where there is a pathological condition operative, or in developing cases in Class III, it is necessary, in order that we may have normal interlocking of the first or principal molars. The beautiful results in Dr. Mendell's case a few years ago certainly have been an object lesson and a help to all who have seen the wonderful results in treating a patient four years of age, and just a look at the final results is proof of the necessity and the feasibility of such an undertaking. Every one present has had experience in expanding in the deciduous dentition, for lack of anterior development, but it has been only in recent years that any great amount of work has been done with malocclusion involving a change in the mesio-distal relations of the jaws, in the deciduous dentition.

Lack of Development.

In regard to the causes which make early treatment a necessity I would name lack of development as a principal factor. Dr. Angle tells us that something like over seventy per cent. of the cases fall into the first great class, and that in this, the malocclusion is in the anterior region in both arches. Should this not make us stop and think

ITEMS OF INTEREST

more seriously of the probable causes and find some means of overcoming these arrested developmental conditions?

The Indian as a race has not this trouble because of his outdoor life and the proper performance of masticatory function in the chewing of tough and fibrous foods. At the age of four there should be a commencement of the separation of the deciduous incisors, indicating that the permanent incisors are forcing their way up or down as the case may be, and if we find no such condition, nature ought to be stimulated by some

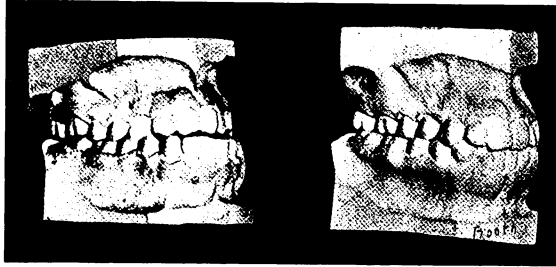


FIG. 10.
Lateral view—pathological cause, enlarged tonsils.

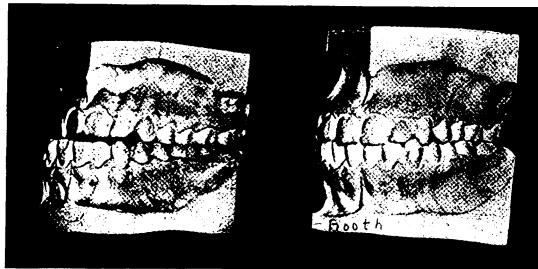


FIG. 11.
Lateral view—(same).

mechanical means whereby the necessary room is provided. Every child at this age should be seen and passed on as to whether or not there will be room for the oncoming permanent teeth. We can not do this, but the general practitioner should have the interests of the patients so at heart that he should explain to the parents about this development, when to expect it, and to advise preventive treatment, if the conditions justify it.

The exact amount of separation necessary can be determined after the presentation of some one of the permanent teeth by making use of some of the precepts which Dr. Hawley has presented to us. For lack of a better way of saying it, the deciduous incisors plus the spaces should equal that of the widths of the permanent incisors (Figs. 1, 2 and 3).

ORTHODONTIA

Loss of Deciduous Teeth.

If we would have the normal development of the jaws it is absolutely necessary to keep all the deciduous teeth *in situ*, up to the time of their normal loss and replacement. If we lose, let us say, the first deciduous molar, what happens? The sixth year molar exerts its wedging influence upon the second deciduous molar, pushing it forward, the natural tendency of tooth movement, lip pressure forcing the anterior teeth distally, and the space is closed. Then the first bicuspid must either erupt buccally

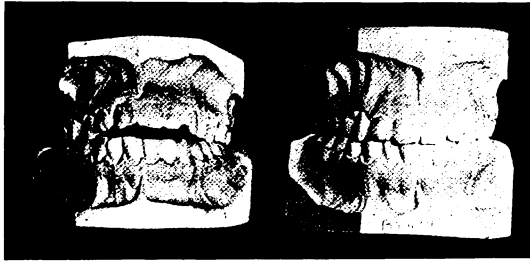


FIG. 12.
Anterior view—(same).

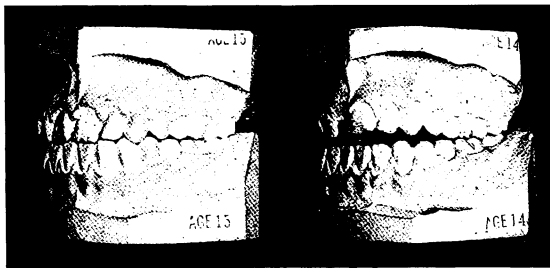


FIG. 13.

Tardy eruption of right superior central owing to prolonged retention of deciduous central.

or lingually or be delayed and classed as tardy eruption. If any molar or cuspid (deciduous) is lost prematurely the space should be maintained by mechanical means such as bands united by wire of sufficient resistance, thus giving the arch the best opportunity for future normal development (Fig. 4).

Again, there must be no loss of tooth structure
Caries as a Factor. on approximal surfaces, for the full mesio-distal diameters of the deciduous teeth are necessary to retain the spaces for the permanent teeth which are to follow. Hence the great need of pointing out to the general practitioner the importance

ITEMS OF INTEREST

of this first dentition which, even though transitory, must perform its full function. The treatment of such possible loss of approximal surfaces, of course, is evident, namely to restore all loss by fully contouring teeth fillings (Figs. 5 and 6).

Adenoids as a Factor.

When there is a pathological condition in the naso-pharynx, such as adenoids, we know that the induced mouth breathing is a prime factor in the disturbances of normal developmental conditions both in the nose and dental arches. The treatment of such abnormal conditions

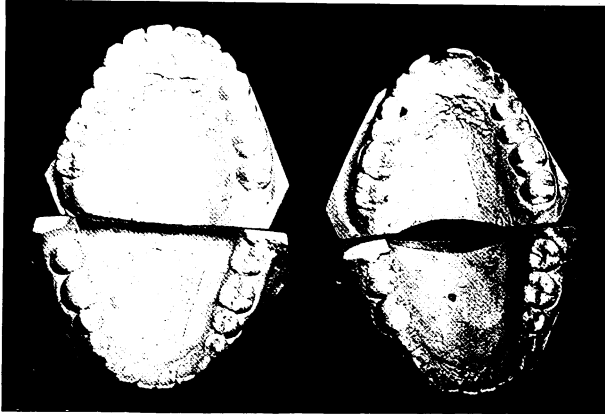


FIG. 14.
Occlusal aspect showing general expansion.

always consists in first removing the cause, at whatever age they might appear, and then restoring the dental arches to normal (Figs. 7, 8 and 9).

Enlarged Tonsils as a Factor.

When the tonsils become hypertrophied we find the child forming the habit of throwing the chin forward, to aid him in breathing, especially if he should have polypi, enlarged turbinates or adenoids. In course of time we find the jaws locked forward, and thus falling into Class III (Angle classification). The treatment here is similar to the above class, namely, remove pathological cause and restore the dental arches to normal (Figs. 10, 11 and 12).

Habits as a Factor.

It is not generally believed that the habits of thumb sucking, lip biting or resting the tongue between the jaws in the deciduous dentition have much bearing on the permanent teeth; nevertheless we often see the habits thus formed in babyhood carried up into childhood with all the attending evils. Safe treatment would be to break the habit whenever the tendency appears (Fig. 16 c).

Non-Eruption and Tardy Eruption.

Nature, for some unaccountable reason, at times fails to supply a tooth germ for a permanent tooth. There is always a shifting in occlusion as a result when this space is not preserved (Figs. 13, 14 and 15).

For diagnosis in dealing with this the X ray is our only recourse.

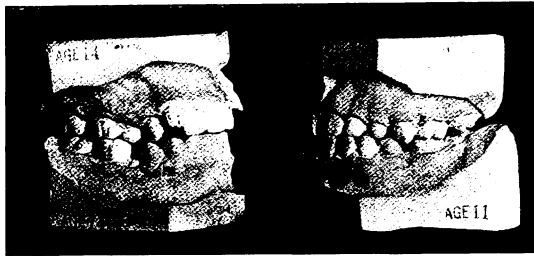


FIG. 15 *b*.



FIG. 15 *a*.

(*a*) Two cases in tardy eruption. The X ray shows two bicuspid in patient, age eleven. (*b*) Abnormal frenum on the left. Tardy eruption of upper cuspid and central. Notice lingual occlusion of incisors.

Loss of Permanent Teeth.

What has been said of the deciduous teeth in their loss shortening up the arches and causing mal-occlusion can be similarly applied to the loss of permanent teeth in the second dentition.

Accidents as a Factor.

As the result of an automobile accident at the age of three and a half a young miss lost one of her central incisors. Within a few months the space was entirely closed. What serious trouble would surely follow if this crowded condition were not relieved at the proper age (Figs. 2 and 3 *c*).

ITEMS OF INTEREST

Abnormal Frenum as a Factor.

This condition is best treated in early childhood soon after the eruption of the permanent centrals (Fig. 15 *b*). The treatment consists in operating upon and cutting out the frenum and cauterizing, bringing the central incisors together and retaining by two plain bands united. The harm of waiting is apparent.



a *b* *c*

FIG. 16.

(*a*) Supernumerary and abnormal frenum. (*b*) After removing same. (*c*) Habit of resting tongue between teeth, showing depressed lower incisors; case also illustrates abnormal frenum.

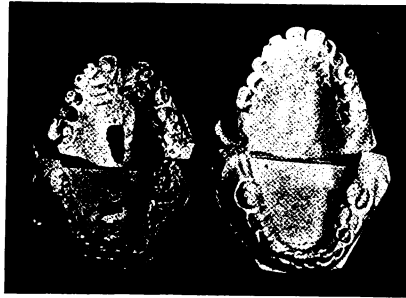


FIG. 17.

Occlusal aspect, showing before and after treatment for supernumerary.

Supernumeraries as a Factor.

It is but logical to remove supernumeraries as soon as possible in order that they may not occupy any room needed by the teeth in normal occlusion. The X ray is of use in diagnosis in these cases (Figs. 16 and 17).

Diet.

Our manner of living has a great deal to do with our development, and how true it is that civilization has brought this curse of "all kinds of prepared foods" to lessen the muscular development around the mouth. All we do is to add water and serve, and at times we often leave the water out; "milk sops" one of our number is pleased to call the whole race.

Improper using of our teeth in not chewing our foods makes the alveolar process a much inferior structure. In fact, may we not attribute the success of those practicing prophylaxis to the fact that they insist on their patients using their teeth for chewing purposes, while at the same time they stimulate healthy conditions in the surrounding structure by massaging the teeth and gums.

The Indians are good examples of a people who use their teeth properly, and well might we learn a lesson from them in getting back to nature.

Treatment. For the accomplishment of our work we must have efficient appliances. I feel that I would not be true to myself if I did not make a statement as to what I have been using, and also to say "that no man practicing orthodontia is true to himself or his patients who works to the exclusion of removable appliances." Mark you, I say "exclusion," for we all realize that the fixed appliances permitting of the almost limitless uses of the "Baker anchorage" have revolutionized our practice and permit us to do almost anything and everything; nevertheless, there is a place for everything and anything that is good.

For three months I gave a case my best attention and thoughts, and in despair turned to a book sent to me by its publishers, and with a removable appliance therein described I accomplished the work in less than two weeks. Was it not worth while? For simple cases in lingual or buccal occlusion (not torsal), and for retention I find the removable appliance admirable in many instances.

For the treatment of cases due to lack of development in the anterior portion of the mouth, we can use the method of Dr. Angle; namely, the lower deciduous cuspids are banded with plain bands and united by (G) wire (German silver annealed) lingually to the incisors. This soft G wire is to be pinched or stretched by a pair of pliers, after Dr. Angle's pattern, and thereby we gain the needed space for the oncoming permanent incisors.

An efficient method of spreading the lower arch and depending on it in turn working through the occlusal planes, to carry the upper with it, is by use of the jack-screw, attached to plain bands on the cuspids at the disto-linguo-gingival angles. These same bands have lugs of iridio-platinum along the first and second molars at their gum margins. The nut of the jack-screw should be tightened not oftener than one turn in two weeks.

I have also used the Jackson removable appliances to advantage.

And last, but not least, the child's size, expansion arch, which is known too well to need any comment.

ITEMS OF INTEREST

Discussion of Dr. Flint's Paper.

Dr. C. H. Hawley. This is one of the very valuable papers presented at this meeting, and is worthy of a great deal of discussion. The trend of every paper presented here has been toward the value of early treatment, the subject which Dr. Flint has chosen. The first part of his paper was a well written resume of the causes of early malocclusion. I have but one comment on that part, and that is to emphasize the necessity of education. Here is a means of educating patients that should not be overlooked. Every patient should be returned to the general practitioner after being referred to the orthodontist, a far better patient than before he came. It only requires a few remarks now and then to accomplish the desired result. The dental practitioner will appreciate that, and it will help to make harmony. An orthodontist will become a very valuable man in a dental community in that way, and wherever cases are referred to him he will better the practice of the dentists.

I am sorry I have not more time in which to discuss the practical part of early treatment. Every tendency toward distal occlusion should be treated at once: every tendency toward mesial occlusion should be treated at once, and all lack of development should be treated.

Dr. Flint rather apologized for the use of appliances not connected with the expansion arch. I think this is a great mistake. When the expansion arch was perfected, the evolution of appliances was not completed. There are many other things that are good; why should we have any hesitancy in discussing them before this society? I am sorry the appliances were not presented more in detail. The subject of the development of the arches, the appliances and the retention also, should receive close attention in the future. I myself have in most cases used the expansion arch; a small arch of eighteen gauge gold wire has done very well; but I appreciate that in many cases the Ainsworth or Jackson appliances might be better, and certainly there need be no hesitancy in using them.

As to the Ainsworth appliance, spoken of by Dr. Barnes and others, the statement has been made that it does not tip the teeth, but carries them bodily. I may say that I have not yet seen an appliance that would affect any more than the one tooth that is banded. I think the lingual spur would tip these teeth that were not banded as much as in cases where ligatures are used. If the second bicuspid tooth, in a mature case, is banded and the Ainsworth appliance used—that tooth may not be tipped, but the cuspid and first molar will be moved by the lingual spur.

By what mechanical principle do they fail to tip, just as when the expansion arch is used? There may be some reason, but I can not see it.

The retention of cases in early life is one of the most serious considerations, because a child has many things to contend with, and its habits are not always regular. There is more difficulty in keeping retaining appliances in place than when the patient is an older person. The treatment must not be considered as absolutely final when it is expected to be so. I have many cases where I have developed the arch according to my measurement of the teeth, where I really believe I have attained final results. I believe the stimulation of the process and the more regular shedding of the temporary teeth will cause the normal eruption of all the permanent teeth. However, I could not promise a patient that there would not be some future adjustment required, as I am not sure of it myself.

Dr. Gray. The subject of Dr. Flint's paper is of especial interest to me, as indeed it must be to all who are engaged in the practice of orthodontia.

We are almost daily called upon to combat the erroneous beliefs of men engaged in the practice of dentistry and medicine, to say nothing of the uneducated laity, with reference to the proper time for treating maloccluded teeth. I believe the fallacious teaching that this treatment should be deferred until the permanent dentition is completed, can only be promulgated by those who study the subject superficially, if indeed they have had the advantage of preparation for, or any considerable experience in the practice of orthodontia.

Some of the chief objections advanced to early treatment have been—

1. Why interfere, when nature will take care of the trouble in her own way.
2. The pain attending early treatment is severe.
3. Wait until the permanent teeth are all erupted, as until that time there may continue to arise certain conditions of malocclusion, no matter what previous treatment has been used.

I need not reply to these objections singly. Suffice it to say that the advantages of treating these dental deformities in their incipiency are so great and so important that they far overshadow any possible disadvantages. How much better to gently guide the teeth toward the normal than it is to allow the case to progress to a condition of serious malocclusion! How much tedious work is thus saved! How greatly does early treatment favor the complete and harmonious development of the dental apparatus, the nasal cavities and their accessory sinuses—and, dependent upon all of this is the symmetry and beauty of the face.

ITEMS OF INTEREST

A recent case in my own practice has done much to strengthen me in my belief that many of the objections to early treatment are wholly unfounded. The little girl had recently undergone a number of surgical operations, some of them of a major character—leaving her in a delicate condition of health. The parents were a little skeptical as to the influence of my treatment on their daughter's health, but were pleased to note, as the work progressed, that the child was inconvenienced but little, and indeed seemed to gain in strength all the while.

I must compliment Dr. Flint upon several particularly interesting points to which he ascribes much importance. Many times we can indicate the requirements of treatment to dentists who seek our advice, as well as to parents. As to the position of instructor in the dental school, looking at it from Dr. Flint's standpoint, I confess it would almost seem a duty to avail ourselves of such opportunities of instructing dental students.

In the case of premature loss of deciduous molars, Dr. Flint suggests that lip pressure pushes the anterior teeth back. My opinion is that it is rather the rapid movement, forward, of the teeth posterior to the space of the lost tooth. And again, in mouth breathing cases, does not the abnormal tension of the cheek muscles *prevent normal widening* of the arches, rather than absolutely contract them?

The importance and value of early orthodontic treatment has long been recognized. S. H. Guilford, in 1859 ("American System of Dentistry"), advised it as essential—and yet modified his advice to suit the mechanical limit of the times. To-day no rational orthodontist can do otherwise than practice and advise early treatment.

Early treatment does prevent malocclusion. It is easier for the patient and operator, and the possible results are infinitely better than might be obtained by delayed treatment. It links in with modern thought—assisting, guiding and permitting nature to develop a normal dental apparatus, and of course betters the neighboring tissues. It must not be supposed that merely enlarging the temporary arches prevents all irregularity. The earlier the pressure is applied to the temporary teeth the greater the influence for preventing irregularities.

Yet beneath small temporary arches the permanent teeth have been forming in cramped quarters *for years*. If full room be provided for their eruption they will come into place far better for it, but may still be irregularly placed and may require more or less treatment from time to time as they erupt. This means that we should treat the little dental cripples as early as we can handle the patient without deleterious physical results. It means that we should expand arches as fully as possible in the first treatment; that the pressure should be applied through the temporary teeth,

while their roots are practically unabsorbed. It means that there should be a minimum of distal pressure, which would cause a distal location of the entire dental arch. It means that the horizontal hinge arch appliances should not be used without attachments to prevent the buccal inclination of the molar crowns.

The Ainsworth principle should be embodied in the apparatus, so that the temporary teeth may carry out with them, bodily, the permanent teeth beneath. The teeth should carry the alveoli and maxillæ with them. This means the opening of the intermaxillary suture, its filling in with new bone and the restoration of the palatal arch where development stopped in the growth of the intermaxillaries in the first place. With this treatment comes, primarily, the best vertical inclination of the buccal teeth and the elimination of many of the hindrances to the proper placing of the incisors.

Early treatment means care of the patient from possibly three or four years of age, off and on, to from thirteen to sixteen or later, dependent upon the kind of case and the health of the patient. The treatment periods are short for the very young. Sometimes but one treatment period is required, with long retention and watching. Generally, however, many treatments are necessary to guide the permanent teeth into place. The retention must be light, strong and comfortable, and has the advantage of being applied to the temporary teeth. Constant watching is necessary to permit the removal of temporary teeth, as their roots absorb, and to maintain the arches for the eruption of the permanent teeth.

If the growth spaces are not sufficient at from four to five years of age, it is better to expand, for here lies the secret of crowded teeth that are almost correct, yet with deficient interproximal spaces and normal gum tissues. The growth spaces must be equal to the central, lateral and cuspid, *plus* what may be necessary to make the width of the succeeding permanent teeth. The space distal to the cuspid is just as essential, perhaps more, than the others, and I believe the lower spaces are more essential, if that is possible, the reason being that the lower teeth erupt first. If they be too far distal, as they would be without the proper growth spaces—the incisors and cuspids would elongate to contact with the opposing teeth or gums, producing close bites. I have casts of many cases of younger and older brothers and sisters, showing these abnormalities and their formation.

If there is irregularity in size or shape of the dental arch, operate! Prevent, and do not trust to nature to do something for which the development period has long passed.

Early treatment promotes better prophylactic care of the teeth, filling of small cavities and the insurance that there are no interproximal cavities

when your operations are completed. Habits are baneful to a *limited extent*. They may aggravate or localize a deformity that is caused by other reasons. Lip pressure is a minimum factor. What has been said to be a lip pressure deformity is really the distal location of the incisors due to their encroaching upon the space of the cuspids in undeveloped jaws.

Now, in regard to early treatment, we can diagnose early, so early as to definitely diagnose malformations or under developments before any teeth appear, or before the molars appear. Our field is to regulate the teeth and provide a sufficient jaw development to hold them; therefore, our basis is the jaw, upon which the alveoli and teeth are situated. We treat irregularity or malformation of teeth and alveoli and jaws to prevent the terminal result—malocclusion. We regulate the jaws. Then let us diagnose tooth and jaw irregularity; not merely malocclusion. Then will come a clearer conception of conditions to be remedied. The earlier the jaws are influenced the better the opportunity of maintaining normal occlusion and all that it means.

As to the development that is about to take place
Dr. D. Willard Flint. in the jaws of these young children, I think we have no right to interpret what nature is going to do at a stated period. At two years of age I do not believe we can possibly say what development there will be at the age of five. In the spring of the year we expect to find blossoms; not fruit.

By Pittsburg time it is 3.18, we are all hungry, and the most acceptable sound would be the dinner bell, therefore I will say no more.

What Can Oral Prophylaxis and Orthodontia do for Each Other?

By N. S. HOFF, D.D.S.

Read before the American Society of Orthodontists, Detroit, 1907.

I have no instruction from your programme committee as to what phase of the general subject I should discuss, and I hesitate to present the subject at all because so much has already been written upon it for the general profession, and because you had it so ably presented at your last meeting. There are, however, some phases which have not been suf-

ORTHODONTIA

ficiently emphasized, it seems to me, and with the hope that I may not weary you unduly, I shall try to offer them in my way for your consideration.

I shall ask your consideration of three propositions, that you may determine whether oral prophylaxis has any relation to them and the principles or practice of orthodontia, and I claim the privilege of utilizing all operative and prosthetic procedures which may be employed in securing complete oral prophylaxis.

Is Prevention of Malocclusion Possible?

First: Can oral prophylaxis as at present practiced be made an important factor in the normal development of the teeth and their surrounding structures, rendering orthodontic interference unnecessary or less difficult?

I shall not take much of your time to remind you that one of the cardinal principles of your art should be to begin your work at the earliest period practicable, and that like all other branches of the healing art, prevention of deformities is as much a department of your work as correction. If this premise is acceptable, you should enlarge your sphere of influence to include the supervision of the first, as well as the succeeding dentitions. Modesty may cause some of you to hesitate to claim this, but I predict that in the near future your best work will be done in conferring with mothers of infants as to the best measures to be adopted to secure a normal development of the teeth and jaws of the first dentition.

By all the principles of logic and reason this work ought to fall to the lot of the orthodontist, since it is his business not only to correct the mistakes of nature, but to present to the practitioner of surgical and prosthetic dentistry the teeth in as perfect a state of development as possible. The business of the general practitioner of dentistry is with the prevention and repair of the ravages of disease of the teeth and their environment.

It is only recently that we have begun to notice that many deciduous dentures are abnormal as to development of the teeth and their positions in the arches. Very few orthodontists, however, have had the courage to suggest, or have offered to apply treatment for their correction. It is generally considered hardly worth while to take the trouble to interfere with these conditions, considering their brief existence. But when we come to consider the influence which these deciduous dentures have in casting the form as well as structure of the more durable second denture, I believe that we will conclude that it is well worth our while to make sure that the way for the normal development of the permanent denture is made as clear and as easy as possible.

ITEMS OF INTEREST

To some extent we have tried to educate people to take care of the first dentition by prescribing a suitable mouth toilet, but this is usually so carelessly done by the dentist that it makes no serious impression on the mother, and nothing adequate is done until some of the deciduous teeth begin to decay and the child complains of toothache when he eats candy. He is then taken to the dentist, who says: "We will fill that tooth with a little cement, or amalgam, which will stop the ache until the tooth is replaced by the permanent one." Is not this the practice generally? There may be a few dentists who are somewhat more thoughtful and take pains to repair damages in such a way as to not only conserve the tooth, but to completely restore its function.

I am not able to supply statistics which would prove beyond doubt that many cases of malocclusion in the permanent dentures are largely the result of lack of proper care of the deciduous dentures, but I can not help believing that if more pains were taken to secure perfect deciduous dentures and to preserve them in perfect condition until the proper time for their removal had arrived, we should have less malocclusion of permanent teeth.

But what has oral prophylaxis to offer that will encourage the orthodontist to begin his work at a period where he should be able to produce the most perfect results?

When we read Dr. Smith's statements a few years ago to the effect that by periodically polishing the teeth and by regular and systematic care by the patient he was able to remove pigments that seemed permanently established in the enamel, and that there was a new life force in the pulp and peridental structures, we thought he was a dreamer, and we had little faith to believe. After seeing actual results in a large number of cases, we became convinced that there was truth in his statements and we were encouraged to experiment for ourselves. Three years of practice and observation have convinced us that much can be accomplished by the so called prophylaxis measures in restoring the vital functions of the oral tissues, by systematic massage and cleanliness in the mouths of patients far past the constructive age in life. More recently it has come to us that if old and diseased tissues can be revived by a carefully applied system of cleanliness and stimulation why should not a similar treatment be valuable in encouraging a better development of the growing structures. We have as yet not gone back as far as the cradle, but we are working in that direction. In the few cases that we have had under observation we are confident that an early application of the system of oral prophylaxis has had the most beneficial influence, not only in retarding and preventing decay of the teeth, but we believe a good influence toward better development of the permanent teeth and

jaws has resulted. Of course, the time and opportunity at our disposal has been insufficient to enable us to make positive statements; but I really believe that by careful application of the principles of oral prophylaxis, beginning with the eruption of the first deciduous tooth, it would be entirely practicable to carry any child through to complete permanent dentition without other surgical or orthodontic interference. Such a proceeding might interfere with our present business methods and practice, but I am sure our efforts would be more cordially appreciated and our art greatly ennobled. A research to prove this hypothesis would be difficult, because of the time necessarily involved, as well as other obvious conditions. Its results, however, would be of immense value, and it is a point that I trust you may keep under observation.

There is no question, however, but that while cases are under treatment some more adequate method of cleanliness and stimulation should be found. The expedients now used for cleaning the teeth and appliances of incidental and extraneous deposits are obviously necessary, but insufficient. A systematic application of oral prophylaxis, that is the polishing of the teeth and stimulation of the gums and peridental membrane at frequent intervals, should encourage the formation of new repair tissue and render retention by mechanical fixtures less mandatory. The appliances at present in use render this somewhat difficult, but by keeping in mind the necessity for this treatment, it is not difficult to devise methods of applying bands, arches and ligatures in such a way as to accomplish needed movements and at the same time leave opportunity for the proper application of the prophylaxis treatment, and the regular use by the patient of the brush and powder, or disinfecting mouth washes. But this leads us to the second division of our subject.

Second.—Can prophylaxis methods offer anything helpful during treatment for correction of malocclusion? Every one who has practiced orthodontia, using the various forms of fixed appliances,

Prophylaxis during Treatment.

has been compelled to devise new ways of cleaning the teeth and appliances, and while many effective methods are now in use, a careful inspection of most mouths undergoing treatment will reveal diseased conditions of the gums, if not incipient caries, in spite of all efforts at cleanliness by the patient operator. We are not sure but that modern orthodontic appliances can be indicted seriously because of the unsanitary conditions they create. With these appliances the regular cleansing of the teeth by the usual tooth brush and powder in many instances is impracticable, and resort is had to antiseptic mouth washes, because they can be applied without danger of disturbing the delicately adjusted ligatures and arches. While these are helpful and convenient



ITEMS OF INTEREST

for use, they are in most cases insufficient. We were greatly interested in the presentation of the method of sterilization made by Dr. Ferris at the meeting last year, and trust that in the discussion those who have made considerable use of it will report results. The method is undoubtedly effective, but can never be sufficient, because it cannot be applied by the patient, nor conveniently at sufficiently frequent intervals to secure the best results. Another objection to depending upon such a measure is that it does not thoroughly remove the material which it disinfects, nor leave the appliances in the best condition to prevent subsequent deposits. Too frequent application of this remedy, like other liquid disinfectants used in the mouth, leads to serious irritation of the mucous membrane and disastrous results. It has been found that the less chemical remedies used in the prophylaxis treatment of the gums, the better the healing process takes place, and we shall find that although good disinfection and a degree of cleansing is produced by forcibly spraying these alkaline chemicals into the mouth, that, unless great care is exercised, injurious, rather than beneficial, results will follow. The great difficulty which confronts us is due to the celerity with which reinfection takes place, because of the exposure inevitable in the mouth, which fortunately is to some extent counteracted by the restraining influence of the saliva when it is in a normal condition, and the practical impossibility of sufficiently frequent application of antiseptic solutions to control the tendency to recurrent unhygienic conditions. We are not prepared to offer a satisfactory solution of this problem, but believe that much can be done to prevent unfavorable results by means that we can devise and control and which may be put into the hands of the patients with safety.

In the first place we would suggest that before any case of malocclusion is put under treatment the mouth should be given a thorough prophylaxis treatment, including the filling of all decayed teeth with a durable material and in a thorough manner. The appliance should be devised with an idea of making it practicable for the patient to accomplish thorough cleanliness by the frequent use of ordinary mouth toilet preparations. All bands should be accurately adjusted, the arches fitted so they will withstand considerable manipulation by a tooth brush without losing their adjustment and effectiveness. The ligatures, especially should be adjusted firmly and the free ends secured so that they will not become loosened nor serve as places for the collection of deposits of food, etc., and above all every tooth should be approachable for thorough polishing on all of its exposed surfaces? The bands, arches and ligatures should be rendered cleanable. This can be accomplished in almost every case where metal appliances are employed. The rubber bands, silk or linen ligatures are unsanitary and need frequent renewals if used, as they are

ORTHODONTIA

incapable of sterilization; threaded arches are objectionable as they afford lodgment for deposits; in fact, all the appliances and adjustments should be made as nearly self cleansing as practicable. Once each week, or oftener if necessary, the mouth should have a prophylaxis treatment, and every unclean spot pointed out to the patient for especial attention. The patient's duty should be to keep the mouth clean during the intervals of absence from the office by such means as may be effective. We find the best means is by the constant use of a good tooth powder and a soft brush. A powder should be provided that is not strongly alkaline nor in other ways much medicated, and which is abrasive and yet soluble. The following formula will serve as a basis and can be modified to meet varying conditions.

Precipitated chalk.....	60 parts
Magnesium carbonate.....	20 parts
Pulverized sugar.....	10 parts
Powdered soap tree bark.....	5 parts
Bicarbonate of soda if indicated.....	5 parts

To this may be added small proportions of any of the flavoring essential oils. It may be made astringent by the addition of 2 per cent. of myrrh, or antiseptic by oil of cassia or carbolic acid. No coloring matter should be added. Patient should be instructed to use this freely morning and night, using a fine bristle tooth brush which has stood in water long enough to make it pliable, or a badger's hair brush will answer. Instruct patient to take a teaspoonful of powder in the palm of the hand and after wetting the brush to incorporate the powder completely into the bristles and brush every portion of the teeth, and without spitting out the powder, fill the mouth as full of water as possible, reinsert the brush, close the lips, and wash the powder all through the teeth and appliances, holding the head over the wash-basin so the escaping water may run into it. Instruct the patient to take time to do this thoroughly at least twice each day, morning and night preferably. Oxidizing powders, tooth pastes containing resinous essential oils, colored pastes and powders should not be prescribed because of their tendencies to disintegrate or discolor the appliances. Our experience has been that such means can be used practically and with very good results, so far as preventing decay of the teeth or irritable conditions of the gums is concerned. The prophylaxis treatment insures clean teeth and keeps the gums and periodontal tissues in the best condition for withstanding the strain of moving teeth.



ITEMS OF INTEREST

Treatment of Malocclusion of Adults.

Third.—Can prophylaxis assist in orthodontic manipulations of teeth in adults?

It may seem that it is hardly worth while to discuss such a proposition as this, for the reason that very seldom are the orthodontists asked to interfere in cases of long standing malocclusions; or those which have been acquired in adult life because of diseases which have affected the periodontal supports of the roots; or in cases where, because of loss of some teeth, the remaining teeth have drifted into malocclusion.

The science and art of oral prophylaxis has set a higher standard for both operative and prosthetic dentistry than we have known before, and if we are not deceived in its drift, it will demand that the orthodontist of the future must extend his work to the treatment of cases of malocclusion in patients for whom such treatment has been considered impracticable. In many cases where pyorrhea has so affected the alveolar support of the roots as to cause the teeth to assume abnormal prominence or decided malocclusion, we find that after such teeth have received prophylaxis treatment the gums and periodontal conditions become healthy; there is a tendency for the teeth to return to their normal positions and relations, and we believe that such teeth, if properly encouraged, would many times of themselves return to normal relations. If they could be brought back by orthodontic force, there is no doubt but that they would resume a good normal function and become valued organs of mastication.

It may be that those of us who have been practicing oral prophylaxis have become over confident and are claiming more than we are justified in doing for this work: but when cases which seemed almost hopeless yield such beautiful results, even after a few days of treatment, and go on improving, it gives us a greater appreciation of the value of the teeth than we have ever before had, and fills one with an enthusiastic desire to save every tooth and to bring all in a perfectly harmonious relationship such as is known only in a perfectly developed set of teeth. With the possibility of eradicating all disease of the structure which supports the roots, and with the modern practicable crown and bridge methods of restoring lost or decaying crowns, to say nothing of the splendid attainments of the present operative procedures, it is possible to make prosthetic restorations of exceedingly high value and of the highest type of esthetic art. Is there not here an orthodontic field that would yield great reward to any one who will take up this pioneer work? Such a broadening of the scope of the orthodontists and prosthodontists would raise the professional standards of all dental practitioners and of every specialty. No one, so far as we know, has put a limit on the age where orthodontic interference should be considered possible. If this has been

done, it has been arbitrarily limited and based on experience rather than on data derived from scientific research, hence can not be conclusive. It seems to us that age alone can never be an accurate adjustment of so important a matter. It is too much like the statement made by Dr. Osler that when men get to be sixty years old they should be chloroformed. Some men are not old at seventy, while others lose their usefulness at a much earlier age. It all depends on the man. So it is with teeth to be moved in old age or even young adult life; the decision must rest on actual conditions. We really believe that teeth can be moved at any age up to sixty years or more, provided the gums, teeth and jaws are free from disease.

If we have directed your attention to newer fields of interest and service, and you should feel disposed to enter them, we shall have done all that we could desire. We trust these few hastily prepared suggestions may commend themselves to your judgment, and that working together with the practitioner of oral prophylaxis we may thus extend our entire sphere of work and usefulness.

Discussion.

This is a subject in which I have been much interested. I wish to speak in regard to the sprays

Dr. O. W. White. Dr. Ferris gave us last year. I have been using them, and find they are very beneficial to my patients. Instead of the essential oils I use the spirits, which make a better spraying solution. It is almost impossible, in some cases, to remove the appliances under three weeks. If we do so it will require a very great deal of our time. By using these sprays we can put the mouth in as nearly an antiseptic condition as is possible. Dr. Hoff says the bacterial plaques are not removed. They are if we get high pressure with the spray, and with the solutions heated to about 122 degrees you can dissolve those plaques. They become so soft the force of the spray will carry them off, except when under the ligature wires.

Dr. Pullen. What air pressure do you use?

Dr. White. About twenty-eight pounds.

Dr. Pullen. Temperature is a valuable point, is it not?

It is a very valuable point. Temperature and pressure are essential to good results from these solutions, points where the ligature wires and arches come in contact with tooth surface being the only places that require attention after spraying.

In one of our first meetings the subject under discussion brought out a few remarks about deposits on the inner surface of arches. When

ITEMS OF INTEREST

we realize that all surfaces of the teeth that are not exposed to cleansing activities are coated with the same deposits, is it any wonder that caries thrives in marked cases of malocclusion?

In using the mechanical treatment of oral prophylaxis you are soon able to tell from touch the amount of foreign material deposited on the enamel. It will require more careful treatment in malocclusion cases than where no appliances are in the mouth.

If it is possible to thus dissolve these plaques with sprays, it will save us a great many hours' work which would otherwise necessitate the removal of appliances.

In using these sprays we leave the mouth in an alkaline condition, which is a better field for bacteria to grow in than if we leave it in a neutral or acid condition. Is there not something else we might use to bring it into a neutral condition?

For several months I have used the sprays recommended by Dr. Ferris. I have used them in accordance with Dr. White's suggestions with very pleasing and satisfactory results.

Regarding the care of the appliances, I remove the arches quite often for cleansing and repolishing, probably on an average of once in three weeks. I also remove the bands when I think they are not in a proper condition after a careful examination has been made. In no case do I allow bands to remain on the teeth more than a year without being removed and replaced.

Dr. Hawley.

How long would you allow a well cemented iridio-platinum band to remain on a tooth?

Dr. Casto.

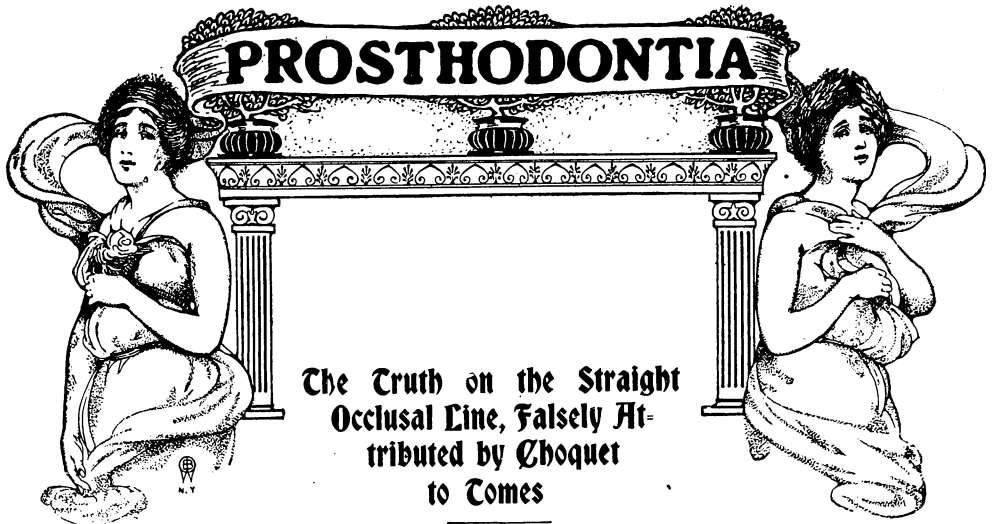
I would not say. Sometimes when you have apparently done the work perfectly it might be defective. If I am not satisfied after a careful examination I remove the band.

Dr. Kemple.

Do you find your suspicions justified after removing these bands?

Dr. Casto.

I have never found any trouble. There might have been trouble in some cases if the bands had remained in place longer.



**The Truth on the Straight
Occlusal Line, Falsely At-
tributed by Choquet
to Tomes**

By Dr. OSCAR AMOEDO of Paris

Read before the "Société d'Odontologie" of Paris, May, 1908.

In the course of my studies on dental occlusion, I have noticed in the writings of Choquet that he persistently attributes to Mr. Ch. Tomes, of London, the notion of an *ideal straight* occlusal line.

As Choquet has not given any bibliographical reference, and as on the other hand, I do not find any such statement in the last edition of Tomes' works, I decided upon inquiring at the source and I therefore addressed the following letter to Mr. Tomes:

March 28, 1908.

CHAS. TOMES, Esq., London.

My Esteemed Colleague—I have repeatedly noted in Mr. Choquet's communications, and have also read in his works, that you describe the occlusion of the dental arches as forming a straight line; that is to say, if the upper dental arch were placed upon a flat plate all the teeth should rest upon this plate. As I have before me several editions of your dental anatomy, in which I have not seen that you advance such an erroneous statement, I beg you to authorize me to declare in a lecture I am to deliver on the 7th of April, 1908, that you have never put forward such an assertion. I beg to anticipate my thanks and remain, my dear sir,

Yours very respectfully,

(Signed) DR. O. AMOEDO.

ITEMS OF INTEREST

Here is the answer to my letter:

March 30th, 1908.

Dear Sir—The statement in question was not made by me, but Dr. Choquet's mistake in attributing it to me arose in this way. He has quoted from the French translation of the first edition of my "Dental Anatomy" published in 1876.

In the first English edition were: "In the human subject no tooth rises above the level of its fellows." I forget the exact words in the

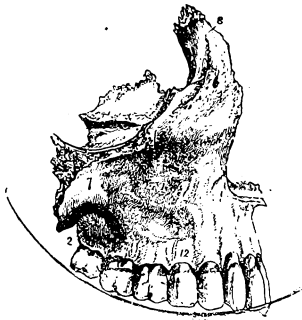


FIG. 1.

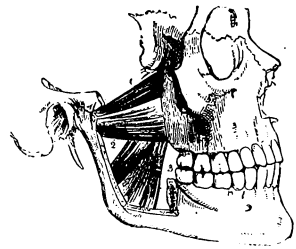


FIG. 2.

(FIG. 12 of the French translation.)

FIG. 1. I have drawn the curve of Spee to show that the occlusal line is far from being a straight line.

(FIG. 15 of the French translation.)

FIG. 2. The occlusal line in this drawing shows very clearly the curve of compensation.

French translation, but they were something like these: "*Toutes les dents se . . . ? au même niveau.*" This is not quite a literal translation and may be made to bear a meaning not intended in the original, as has been done by Dr. Choquet. What I meant was that no individual tooth rises above the level of its next neighbor.

But in later editions of my "Anatomy"—last Sixth Edition in 1904—the whole sentence has disappeared and is differently expressed. I do not remember, but I suppose I thought I had not expressed it well and re-wrote it.

Dr. Choquet's argument is a good illustration of the danger of quoting an old edition of a book which has been through many editions since, and still more by quoting from a translation without seeing that it is

PROSTHODONTIA

exact. The translation is not far off the meaning of the original, but it is not quite the same thing to say that "no tooth (singular) rises above the level of its fellows" and "all the teeth (plural) rise to the same level."

Believe me,

Yours very truly,

(Signed) CHARLES L. TOMES.

Manington Hall, Norfolk.

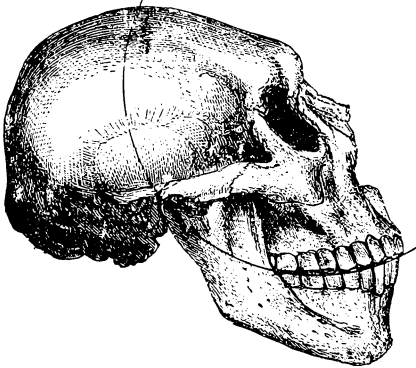


FIG. 3.

(FIG. 171 of the French translation.)

FIG. 3. Head of an idiot. The curve of Spee I have drawn is in contact with the occlusal borders of all the teeth and passes by the anterior surface of the condyle.

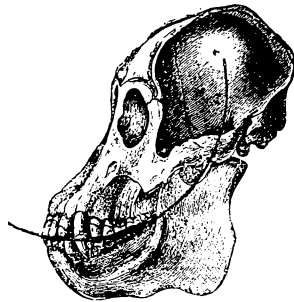


FIG. 4.

(FIG. 170 of the French translation.)

FIG. 4 Head of an adult male orang. I have drawn the curve of Spee and find that it divides the crown of the upper canine into equal parts.

This answer is categorical, and encloses an excellent lesson for the future.

According to the foregoing indications, I referred to the French translation of the first English edition and this is what I find, page 5, line 6:

"Je ferai précéder la description des dents de l'homme de quelques mots sur les caractères qui différencient la dentition de l'homme de celle des animaux.

"Chez l'homme, les dents s'élèvent toutes au même niveau; elles sont en contiguité parfaite, sans intervalles entre elles."

The author gives here the different characteristics between human and animal teeth, and not merely a simple definition of the dental arches.

ITEMS OF INTEREST

The mention of the second paragraph, without that of the first, puts a misconstruction upon the real meaning of the latter.

One need only glance at the figures in this treatise of *compared dental anatomy*, to see that the elephant, for instance, has canines one or two metres long; that those of carnivorous, anthropoid and other animals are considerably higher than their neighbors, and that the teeth of man alone are all on the same level.

But saying that in man the teeth are all "on the same level," does not imply that they are all "on a straight line." In Paris there is a municipal law which obliges all houses to be built on the same level; but no one would imagine that the town authorities had decreed that all houses should be built upon the same straight horizontal plane.

If the reader has yet a doubt about the author's meaning, the following paragraph, from page 416 in the same work, defining the dental arches, would clear away all misconceptions:

"Il n'y a pas de diastème dans les races humaines; il n'y a pas de différences sexuelles dans le dentition; aucune dent ne dépasse le niveau des dents voisines et toutes sont disposées sans interruption, suivant une ligne courbe."

This refers, without any doubt, simply to the level of neighboring teeth, the same as for the houses in the city streets.

This does not prevent the existence of compensation curves in the dental arches, any more than it prevents the want of leveling in the streets of Paris, whilst still observing the said law.

Contrary to the opinion of the celebrated London anatomist, I hold that the French translation of his work is perfectly correct, and that nothing less than a quarrelsome disposition will see in it anything else but what is clearly put forth.

If the reader wishes for further proof, he need only consult the figures of the dental arches, pages 29, 39 and 413; none but human dental arches figuring in this work, he will clearly see the design of the curve of compensation.

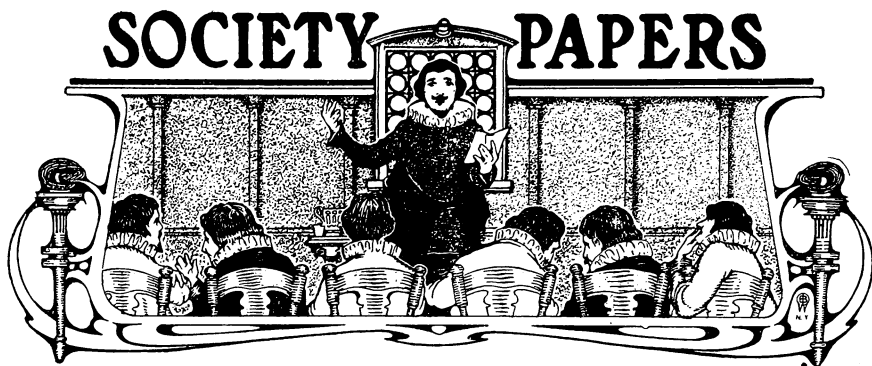
In short, the truth about this famous straight line of articulation is that neither Tomes nor any other anatomist whatever has ever mentioned it.

On the other hand, Bonwill, of Philadelphia, in 1858,* and Spee, in Germany, in 1890,† have published their studies on the compensating curved line. The latter studied it very specially, so much so that it is now called Spee's curve.

I apologize for this extensive note, and beg you will see in it only an intense desire to put things in their proper place.

* Bonwill, "Articulation and Articulators," *Trans. Am. Dent. Ass.*, 1865.

† Spee, "Die Verschiebungsbahn des Unterkiefers am Schadel," *Archiv für Anatomie und Physiologie*, 1890, p. 285.



President's Address.

By WALTER WOOLSEY, D.D.S., Elizabeth, N. J.

Read before the New Jersey State Dental Society, Asbury Park, July, 1908.

Being unable to secure the Auditorium where we have met for so many years, the committee, after much difficulty, finally secured this building as the most desirable place to hold our meeting. It therefore gives me much pleasure to have the honor of addressing you for the first time in Asbury Park's famous Casino, and to extend a most hearty welcome to the members of our society and all visiting members of our profession to this our thirty-eighth annual convention; and I hope that the few days spent at this meeting will prove both pleasant and profitable.

As perhaps most of you know, the work of our society is carried on through the various committees, and to be chairman of any of the important committees means work, and plenty of it. In this way only can they become familiar with the work of the society and be in line for advancement.

To prepare the programme for a meeting like this, and to secure competent men for essays and clinics in keeping with the reputation of our society, means more work, perhaps, than the average member realizes; and right here I wish to express to the members of the several committees my hearty appreciation of their labors during the year, and to extend to them the thanks of the entire society for their faithful efforts in giving the members the best possible to be obtained for this meeting.

Special mention is due to the chairman of the Exhibit Committee, Dr. Gregory, in acknowledgment of his arduous labors resulting from the change in place of meeting.

ITEMS OF INTEREST

Reorganization. The Committee on Reorganization of State and Local Societies, appointed last year, has been working very hard to accomplish a basis for the Illinois plan of reorganization. They have visited all the local societies, seven in number, and endeavored to interest them in adopting a plan of consolidation. Their report embodies such radical changes to be made in our Constitution and By-Laws, to meet the different conditions existing in each section of this State, that I think it should be very carefully considered before we take any final action. Therefore I recommend that a larger committee be appointed, consisting of nine members: one member from each of the local societies at present a member of the State society, two from the State society, and the vice-president, to continue the work so well started by the present committee and to report at our next annual meeting.

Increased Membership Desirable. It seems evident to me, and it should to every member of this society, that it is about time that something should be done to induce every ethical dentist practicing in this State to become a member of this society.

The license to practice in this State is considered very desirable, and if so, every man holding such a license should consider it his duty as well as a privilege to join the State society, which by its efforts in years past in having good dental laws passed, and competent men appointed on the Board of Examiners, has placed the practice of dentistry in our State on a high plane.

When one considers the advantages, both social and educational, to be derived from membership in a society such as this is, it is surprising that so many fail to take advantage of them.

If each member would make an effort to bring in one new member, we could double our roll in one year, and I believe it could be done if we only tried. I would like to suggest that in our welcome of a new member we should be especially cordial and friendly, extending to him the warm hand of fellowship, thereby lifting the newcomer out of that embarrassment and sense of loneliness that comes to most men upon their first appearance in a society. In this way only can we expect to inspire the new member to take an interest in the welfare of the society, and have him filled with a desire to attend the next meeting.

Jury Duty. The Committee on Abolishment of Jury Duty became active last winter, and presented a bill in the legislature, exempting all dentists in active practice from petit jury duty. This bill passed the Assembly by a good majority, but was lost in the Senate because there was no one on hand to look

after it. This bill would have failed in the Assembly also, but for the fact that several members of our Legislative Committee and officers of the society went to Trenton one evening and had a hearing before the committee there, and succeeded in getting their consent to let it pass the Assembly. I think that if we had had some representatives from our society present when it came up in the Senate, it would have become a law. I hope our new Legislative Committee will take up this bill again this winter, and succeed in having it passed; or if we go to the legislature this winter to have some changes made in our present law, I think it would be a good plan to have a clause inserted exempting all licensed dentists from jury duty, and I believe that would be passed with the other changes.

Examination of School Children's Teeth.

Of the many subjects before the dental profession at the present time, I know of none that is receiving more attention or creating more discussion at dental society meetings than the examination of children's teeth in public schools. While this subject has been under discussion for several years, and almost every president has referred to it in his address, urging some action to be taken, still nothing much has been accomplished. Our Society this year appointed a new standing committee to take up this work, making your president chairman, with instructions to become active as the time seemed ripe for success.

The president of our Board of Education in Elizabeth being a physician with broad views on public matters, I was able to enlist his support in this movement, and he requested me to address a letter to the board calling their attention to the necessity of dental inspection in the public schools.

The letter was favorably received and a committee appointed to take up the matter. I was called before the committee, with the result that they recommended to the board, the appointment of a dental inspector. I will read their report as published:

"The appointment of a dental inspector for the schools was decided upon at a meeting of the Board of Education last night. He will get \$250 a year for his services. The action was taken in the adoption of the following committee report: 'Your special committee, appointed to investigate the question of dental inspection for children in public schools, respectfully reports that the matter has had careful consideration, and that your committee is convinced that all children should be taught to care for their teeth, and that it is the duty of the school authorities to take such action as will result in affording all necessary information to the children under their charge. Your committee therefore recommends that

ITEMS OF INTEREST

one dental inspector be appointed, his duties defined by rules to be adopted by the Board of Education; that the salary of the inspector be \$250 per annum; that his term be for one year; that he act under the supervision of a member of the New Jersey State Dental Society to be appointed by the Board of Education, such supervisor to serve without compensation, and during the pleasure of the Board of Education.' ”

As far as I can learn this is the first time in this country that a Board of Education has appointed a dental inspector on a salary, and I believe that this is the only way to have it done. The medical inspectors in most cities are paid, and we should demand the same. With this good beginning we hope to have it taken up all over the State. Madison, N. J., has recently appointed a dental inspector, and Hackensack has appointed one also, but they receive no compensation.

Newark now has the matter under consideration, and we hope to have it accepted by the board some time this year.

Several of the New England States have taken up this work already, and many cities in Germany and England have appointed dental examiners. Their reports show that about ninety per cent. of the children examined had diseased teeth.

New York City has dental examination in connection with the medical, and they find a very large percentage of children with decayed teeth.

The main object of this examination is to instil into the minds of the younger generation the great importance of preserving the teeth and of keeping the mouth in a hygienic condition.

The oral cavity is the main gateway to the entire body, and it is through this gateway that many destructive diseases find entrance, originating from infectious material in the mouth. Therefore it is of the greatest importance that the teeth of all children in the primary and grammar grades, between the ages of six and fifteen, should be carefully inspected by qualified dentists, appointed by the Board of Education, that the proper treatment of dental caries may be begun as early in life as possible.

When this work becomes started it will of necessity lead up to the establishment of free dental clinics in our large cities, and in this way can the public be shown the practical benefits of this work.

In the long career of medicine and surgery there has been nothing that has elevated the medical profession in the public estimation so much as the establishment of hospitals and institutions for the care of the poor. Our own career as a profession has been short, but its advancement has been very rapid, and we have added incalculably to the comfort and happiness of the human race, mainly through our ministrations to those who could afford our fees, but its greatest glory will be reached when it finds

a way to give some care to the teeth of the poor. The task may not be agreeable to the busy dentist, but the day will come when men will volunteer to give a certain amount of time each year to charitable work.

In a recent lecture before a dental society in New York City, Horace Fletcher, the noted investigator, made the remark that preventive medicine consists of but two things—mental and dental. If this be true it means much for our profession, especially in these days when we hear so much said about the practice of preventive dentistry, and I think the time is near at hand when we must endeavor to apply preventive treatment to the various conditions as they appear in the oral cavity.

Ethyl Chlorid vs. Nitrous Oxid.

In Minor Surgery, and as a Preliminary Anesthetic.

By MAURICE GREEN, D.D.S.

Chief of the Oral Surgery Clinic, New York College of Dentistry.

Read before the Medical Society of the Borough of Bronx, October 9, 1907.

The anesthetics with which I am most familiar and which I shall discuss this evening are nitrous oxid and ethyl chlorid. The first is familiar to you all; the last to only some of you. I shall compare the two impartially from my own clinical experience, and you will find nitrous oxid at a disadvantage from my observations.

Both are colorless liquids with the peculiar odor of most anesthetics; both are of rather sweetish taste; ethyl chlorid is explosive; nitrous oxid will support combustion, burning with a bright blue flame.

The containers in which they are marketed are no doubt familiar to you. The history of these anesthetics is too long to dwell on here, and can be found in all works on anesthesia.

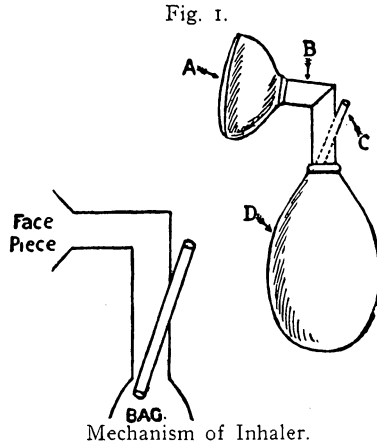
Ethyl chlorid is pleasant to inhale when given slowly, and I find that the patients do not resist so often as with nitrous oxid.

The apparatus for administering nitrous oxid consists of a rubber bag or copper tank into which the desired quantity of gas is released, and the patient inhales by means of a face-piece that has an expiratory valve, thereby permitting the escape of the carbon dioxid and the inhalation of nitrous oxid only, so that there is no re-breathing.

ITEMS OF INTEREST

The method I use with ethyl chlorid is somewhat different, as you can see by this inhaler (Figs. 1 and 2), which is simple and almost self-explanatory. There is no cotton or gauze of any kind used with this apparatus, as it is unnecessary.

After placing the patient in the required position, adjust the face-piece over the mouth and nose, then spray a small quantity of the ethyl chlorid into the admission tube (C), closing the same with the thumb;



A.—Face piece, flexible rubber; B.—Metal tubing about one inch in diameter; C.—Metal tube conducting ethyl chloride from container into bag; D.—Flexible rubber bag.

allow the patient to take five or six inhalations and repeat this procedure until the breathing becomes slightly stertorous; this stage is sufficient for a mere lancing or tooth extraction. Should a longer anesthesia be required, continue the spraying until a deep stertorous breathing ensues, when a three to five minute operation may be attempted. This refers mainly to operations about the buccal cavity where you are compelled to withdraw the inhaler and discontinue your anesthesia during operations; where this is not the case, as in operating about the body, an indefinite anesthesia may be maintained.

During the administration the pulse increases in strength and a profuse perspiration bathes the forehead, denoting a stimulation of the higher centers, which I consider of advantage.

The purity of the ethyl chlorid is absolutely essential for the safety of your patient, and tubes with the automatic caps, not capsules, of 3 or

5 c.c. are more convenient and economical for the operator, as this enables him to give each case the dose of anesthetic it may require.

Average Dose.

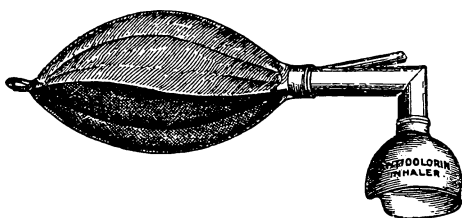
Ethyl chlorid, 3 to 5 grams, will give a longer and more profound anesthesia than 8 to 10 gallons of nitrous oxid, which is the average quantity of that anesthetic.

From innumerable nitrous oxid administrations and about two thousand five hundred of ethyl chlorid, I shall compare the two:

Duration of Narcosis.

With nitrous oxid short and uncertain, operator must work rapidly; with ethyl chlorid, comparatively much longer and more profound; operator can work more deliberately.

Fig. 2.



Inhaler complete.

Cyanosis.

With nitrous oxid, invariably present; no cyanosis under ethyl chlorid.

Apparatus.

Nitrous oxid, very cumbersome and expensive; ethyl chlorid, portable, cheap, durable and aseptic.

Average Expense.

Nitrous oxid, sixteen to twenty cents; ethyl chlorid seldom exceeds ten cents, for each administration.

Mode of Administration.

Nitrous oxid escapes from the cylinder noisily, which is greatly detrimental in nervous cases; ethyl chlorid is absolutely noiseless in administering.

Effect on Patients.

Patients often tell us that under nitrous oxid they see and hear what is going on, and at times even feel it, but are powerless to move; this is not the case with ethyl chlorid, as you can always get a positive anesthesia. With nitrous oxid we find the muscles contracted, the reverse being the case with ethyl chlorid.

After Effects.

In both cases the patient revives quickly and is able to leave the office soon, without feeling ill, but you will probably get more vomiting after the ethyl

ITEMS OF INTEREST

chlorid; in neither case is it one per cent., and of no severity; in dental operations I attribute it generally to the swallowing of blood.

Statistics show that nitrous oxid is the safest anesthetic known, but there is no doubt in my mind that when the proper method of administering ethyl chlorid is reached, it will be found equally safe.

Position of patient should be recumbent or semi-recumbent if possible, but the upright may be used if necessary without any danger; the clothing should never be tight about the neck or waist in administering any anesthetic, so as not to prevent free breathing.

Contra-indications with either anesthetic: There should be no obstructions of the air passages.

Nitrous oxid I have given for short operations only; ethyl chlorid. I have given as long as forty-five minutes. The operations have varied from the extraction of a tooth to the reduction of a fracture of the tibia and fibula, for mastoid, axillary, rectal and vaginal operations; for the removal of necrosed jawbone; for tonsilectomy; for adenoid removal and many other operations. In no instance have I had the slightest uneasiness, or failed to have the patient completely anesthetized at all times; the ages have varied from eighteen months to old age.

For convenience we will place the deaths from
Fatal Results. nitrous oxid at 1 in 500,000, although I think it is even less than this, as it is given daily so often by the dentists throughout the country without any records being kept, that no exact statistics can be maintained.

For ethyl chlorid I can only say that I have a positive knowledge of 12,000 administrations in the manner I have described to you, without one fatality.

Of the fatalities heretofore reported, some twenty-one in number, after due analysis, none of them can be directly attributed to the ethyl chlorid, as most of them occurred some time after the patient regained consciousness, and the post mortems showed death due to other causes. We do not even know what method of administration was used, and I have heard from competent authority that these deaths should not be attributed to ethyl chlorid, for, with a drug as volatile as this, which is so quickly eliminated from the system, it would seem that if it prove fatal it would act during the administration and not some time thereafter.

I am sure that ethyl chlorid would be universally used in its appropriate sphere if a uniform method of technique were adopted.

Before closing, I wish to say a few words of
Somnoform. the new anesthetic known as somnoform. I think its main safety lies in its containing 60% of ethyl chlorid (methyl chlorid 35%, ethyl bromid 5%).

There have been several deaths reported from this anesthetic in dental offices, as I have noted from various dental journals. I can not see why one should use a proprietary combination when so well known an article as ethyl chlorid answers the same purpose and is safer.

Somnoform in my opinion acts too rapidly; the patient takes a few inhalations and is under; the change from the normal is too sudden. I prefer a slower acting anesthetic; I can observe the patient better and, if all is not well, I can stop before it may be too late.

The paper I have read to you is taken from my own clinical observations; it may not come up to your scientific standard, but I have tried to make it as plain as possible. There is one more remark to make before finishing, and that is that the dental surgeon of to-day is much further advanced in operating painlessly in minor surgery than the physician. Any of you gentlemen can go within less than five blocks of this room and have a tooth extracted under a general anesthetic, but how many of you are prepared to perform a minor painful operation, such as lancing, or the removal of a splinter under an anesthetic? All that is necessary is a tube of ethyl chlorid in your office; you need no inhaler if you do not wish it; make a simple paper cone, place some absorbent in it and allow the patient to inhale the vapors as sprayed through the small end of the cone. It is simple and well worth a trial, although more of the anesthetic will be required than with a regular inhaler adapted for the purpose.

Codrenin as a Local Anesthetic.

By C. C. MILLER, D.D.S.

*Attending Dental Surgeon to Indiana Girls' Industrial School and
Indiana Boys' Reform School, Plainfield, Indiana.*

Centuries ago the natives in Peru began the use of cocain in a very unscientific way. They used it as a stimulant by chewing and smoking the leaves of the coca, and by making it into tea. And while at that time it was used for its anesthetic properties in destroying the sense of hunger and fatigue, it was not until the last quarter of a century that cocain really became known to the medical world as a local anesthetic.

Within the last few years we have learned that wonderful results can be obtained with cocain; but we have also learned that it is not without its elements of danger and uncertainty. With some patients we note a great degree of excitement, depression of the cardiac and respiratory

ITEMS OF INTEREST

organs, while in a great many cases where every aseptic precaution is taken much annoyance is caused by way of after pain and sloughing of the gum where the injection is made.

For years manufacturing chemists have endeavored to perfect a local anesthetic without these unpleasant effects. As a result of this effort we have on the market such drugs as eucain, nervocain and stovain; and yet cocain has ever remained before us as the most available local anesthetic.

Many preparations of cocain have been presented to the profession, but my success with these has been very indifferent. I have made my own mixtures and have used pure fresh solutions, but always with a sense of fear. I have finally given up the use of local anesthetics almost entirely and turned my attention to such preparations as nitrous oxid, ethyl chlorid and somnoform. The virtues of these, however, it is not my purpose to discuss at this time.

My attention was recently called to "codrenin," a preparation made by Parke, Davis & Co. Codrenin represents cocain, 1 per cent.; adrenalin, 1:5000, with $2\frac{1}{4}$ grains chloretone and normal salt solution q. s. 1 ounce. The important feature of codrenin is that the adrenalin constricts the superficial blood vessels and localizes the effect of the cocain. By the use of this combination, not only is anesthesia secured by a much smaller quantity of cocain and the danger of its tonic effect reduced to a minimum, but the duration of the anesthetic is very much prolonged and the operation is practically bloodless. In regard to codrenin I present the following clinical notes:

Clinical Notes. A. G. B., age twenty-five, very strong, health perfect; a man who had never had to endure pain, and has no time or patience for it. Upper left bi-

Case I. cuspid root to be extracted. Insisted on having a painless operation. After the usual injection of codrenin I attempted the operation, but only to have the tooth root break each time I took hold of it. The root was finally dislodged with much difficulty, the operation lasting probably fifteen minutes. While this operation was absolutely without pain, there was sufficient injury to the maxillary sinus wall to cause a very sore and swollen face for several days. With due care and anti-septic treatment, however, recovery was very rapid.

Case II. Mr. Mason, age sixty years, good health, but stone blind. I injected codrenin and extracted twelve teeth without the least pain. The healing and hardening of the gums was unusually rapid.

Case III. Ralph H., age nineteen, extremely nervous. Lower first molar badly decayed, floor of pulp cavity broken down and cavity filled with inflamed and highly sensitive gum tissue. From this he complained of severe pain. I injected codrenin full strength until gum was blanched and extracted the roots separately, then took pliers and tore away the inflamed gum tissue which was still hanging to the socket. By this time the patient was very nervous and trembling, but when asked if there was any pain accompanying the operation, said there was none except the first insertion of needle.

Case IV. Dr. C., physician, age fifty-five, health good. Extracted fourteen teeth with codrenin. No pain, no sloughing, and no unnatural soreness followed. Healing very rapid.

Case V. Mrs. W., age thirty, tall, blonde, good health, but extremely nervous. Superior first molar very sore to touch, gum swollen. I injected codrenin and extracted tooth without pain, but found quite a pus sac on root. Following this extraction the patient reported very severe pain in tooth socket and for twenty-four hours was unable to come to my office. I prescribed borol as an antiseptic wash and next day pain had subsided and gum was healing in a very normal manner. In this case I attribute the after pain to the fact that the adrenalin contracted the inflamed tissues. And yet I am inclined to believe that this patient exaggerated her suffering somewhat; for I have since injected codrenin into gums which were quite swollen and sore, and where pus sacs were found on the roots, with very little pain following, as will be seen by the following:

Case VI. Robert C., age thirty-two, two hundred and fifteen pounds. Superior second molar roots very sore, gum swollen. Injected codrenin; extracted three roots separately. Found pus sac on one root. Twenty minutes later patient complained of pain. Gave him antiseptic wash and dismissed him. Twenty-four hours later I called him by 'phone and he reported that pain lasted about two hours, but was not severe.

Case VII. Halstead M., age thirty, health perfect. Superior first molars very painful, sore and swollen. I opened tooth and drilled through roots and applied treatment in effort to save tooth. Twenty-four hours later patient returned with tooth no better. I injected codrenin and extracted tooth with very little pain, found quite a pus sac on root. Gave him borol to use as mouth wash; patient reported immediate relief and no after pains.

ITEMS OF INTEREST

We may note in the last two cases that the vital and nervous forces are very strong, while the lady was almost on the verge of collapse, which condition would materially affect the recovery. I might give many more cases, but these represent about every condition I have met with in the use of codrenin.

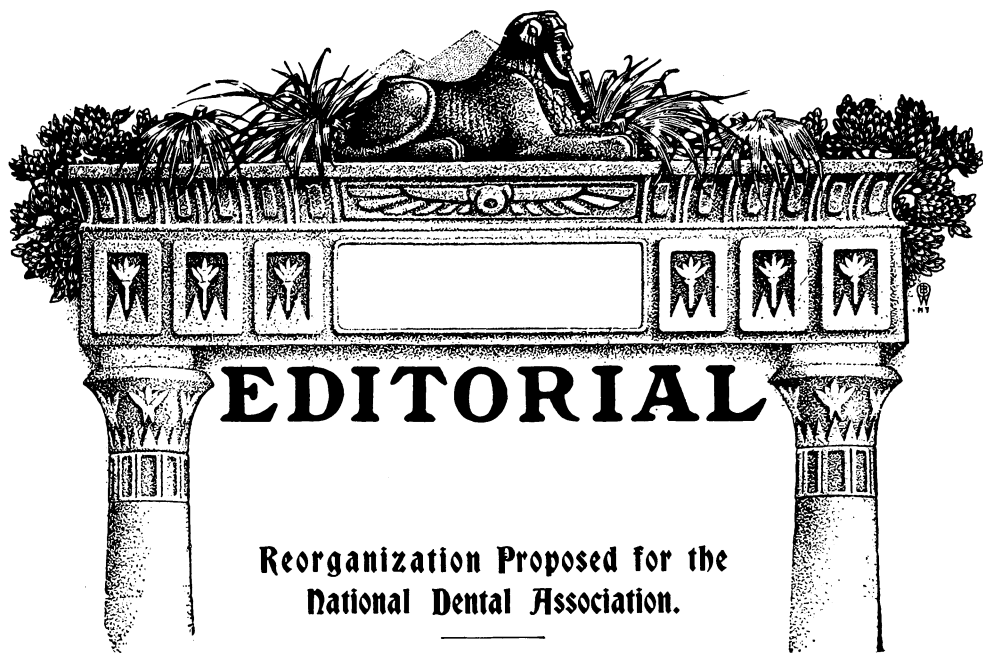
In my work at the Indiana Girls' School I have probably used codrenin one hundred times for extracting, and while these girls will not always say the work is done without pain, they will usually admit that inserting the hypodermic needle is more severe than the extracting.

I find that in cases of extremely nervous patients I get good results by applying a tablet of cocain to the gum at the point where I expect to make the first puncture, and follow just inside the blanched portion each time. On the whole, I have every reason to believe that with these girls suffering is almost entirely from fright. I want to mention one case from the school:

Case VIII. Frances Hall, age nine, girl, very frail, pale and anemic. The four sixth year molars badly decayed, three of which were free from soreness and were extracted without pain. The lower left tooth had a chronic abscess opening on the outside of the ridge. She said it had been there for over two years. There was a great deal of pus formation. Roots were sore. I injected codrenin into the tissues on the lingual side of the tooth, being careful not to use more than these healthy tissues would take up. Extracted these roots separately with very little pain and no serious after pain, and the abscess healed very readily.

My experience with codrenin at the Indiana Boys' School has been almost universally successful. As a rule they appreciate the anesthetic results and are glad to have it used where an extraction is indicated.

Codrenin is prepared in one ounce glass stoppered bottles only. It can be used full strength, or diluted with normal salt solution. Dr. Fritz Hartwig, dentist of Vienna, found that by using adrenalin with cocain in a solution containing 2/10% of the anesthetic, practically the same effect was produced as with a 2% solution. Personally, I prefer to use codrenin full strength, although I have had some very good results with equal parts of the anesthetic and normal salt solution.



Reorganization Proposed for the National Dental Association.

At the recent meeting of the National Dental Association, in Boston, the topic of most vital interest was "reorganization." It was discussed in the President's address. It was urged by two special committees appointed by State societies. The presentation of arguments before the Council attracted the largest audience that ever attended a Council meeting, while in the lobbies wherever three or more men made a group it was safe to guess that they were asking one another whether or not reorganization might be at hand.

The President, Dr. William Carr, made a plea for a larger association, his proposed method of enlargement being to change the By-Laws so as to make it possible for a greater number of men to apply for membership than is possible under the present restrictions. To this end he suggested a committee to revise the Constitution and By-Laws, and to report at the next meeting.

Committees specially appointed by the Massachusetts State Society and by the Maine State Society presented memorials to the Council urging reorganization along the lines of the American Medical Society, which would include the maintenance of a National Association Journal.

ITEMS OF INTEREST

If one might judge by the warm applause which greeted this proposition and the arguments thereon, there is a growing sentiment in the body of the profession favoring some such change.

The president's address was referred to a committee, which later recommended the adoption of the president's plan, and a Committee on Revision was authorized by vote of the Association. At this juncture Dr. Ottolengui presented a draft of a new Constitution and By-Laws (which is published in this issue), and while explaining that under the present Constitution he might introduce this as an amendment, and insist on its consideration by the Association next year, he declared that it would be wrong for an individual to take advantage of constitutional technicalities to urge his own plans; consequently he asked that the proposed new Constitution and By-Laws be referred to the Committee on Revision to be appointed by the president.

Is Reorganization Really Demanded?

The question of the reorganization of our National Association is now fairly before the profession of this country. Primarily it is in the hands of a small committee of three men ((at the moment unknown to the writer), but in the final analysis no scheme of reorganization will convert the present Association into a truly representative national body, except with the approval and support of the great majority of the dentists of the country of the better class. Have we any sign by which the wishes of the profession at large may be prognosticated? A reorganization of State societies throughout the country has been progressing for the past five years, and the general trend in all cases has been in the same direction: a State body which shall include local societies, so co-operating as to produce a harmonious State machine. This, in dental circles, has been called "the Illinois plan," but in truth it is the American Medical Association plan. Is not this significant? For what final purpose can the State societies have been thus reorganized except to lay the foundation for a vast National Dental Association in imitation of the American Medical Association? There are objections to this movement of course; there always are objections to every revolution of things. But these need not be considered at this time. Let it suffice that the subject is now open for discussion. Nine State societies have already reorganized and it is said that three more will adopt similar plans by next year. Does



this mean a reorganization of our national body along similar lines, and the formation of an association similar to the American Medical Association? Will the leaders in the Illinois movement and representatives of the States which have adopted the Illinois plan express themselves? The pages of *ITEMS OF INTEREST* are offered for a free, impartial, impersonal, and dignified discussion pro and con. If we are to reorganize, let us endeavor to do so along the lines which will promise the greatest and most permanent success; the time for constitution tinkering has past. Let the students of the question consider the Constitution presented in this number and dispassionately dissect it, criticizing favorably or adversely, to the end that the Committee on Revision may feel the pulse of the profession.

Constitution of the National Dental Association.*

Proposed at Boston, by R. OTTOLENGUI, M.D.S., LL.D., and referred to Committee on Revision of Constitution and By-Laws.

ARTICLE I.—Name.

The name of this organization shall be the National Dental Association.

ARTICLE II.—Object.

The object of this Association shall be to promote the art and science of dentistry. To achieve this the Association shall endeavor to unite the dental profession of the United States into one compact body, thus creating a power the units of which, working with a harmony of purpose, will foster fraternal relations and intercourse among dentists; safeguard the material interests of the profession; elevate the standards and improve the methods of dental education; secure the enactment and enforcement of just dental laws, while aiming at a unification of State dental statutes, and enlighten and direct public opinion in relation to oral hygiene, dental prophylaxis, and advanced scientific dental service, to the end that dentists and dentistry shall be held in higher esteem in the community.

* Compiled and adapted in conformity with the Constitution and By-Laws of the American Medical Association.



ARTICLE III.—*Membership.*

The membership of this Association shall consist of such members of the Constituent Associations, and such members of the Army Dental Corps, and of the Naval Dental Corps (when established), and such others as shall be elected in accordance with the By-Laws, as hereinafter provided.

ARTICLE IV.—*Constituent Associations.*

SECTION 1.—State and Territorial Associations which have, or which hereafter may, become organized in conformity with the general plan of the National Dental Association, and which have declared their allegiance to said National Association, and which shall agree to the formation and perpetuation of the House of Delegates, shall be recognized as Constituent Associations.

SECTION 2.—To be organized in conformity with the National Dental Association, State and Territorial Associations must include as constituent members local dental societies, admitting individual members thereof to membership upon application and election; and each such local society shall have equal rights within the parent body in proportion to its own membership. All State and Territorial Associations not already organized in the above manner shall be granted five years in which to effect such reorganization, during which interim constituent membership may be granted. But after five years, if reorganization shall not have been effected, such delinquent associations shall cease to be constituents of the National Dental Association, unless an extension of time for reorganization be granted by a two-thirds vote of the House of Delegates.

SECTION 3.—The term "State Society" shall be understood to mean the representative dental organization of any one of the States which have been received into the Union, and whose active membership is restricted to legal practitioners practicing within the legal borders of such State. The term "Territorial Society" shall apply in similar manner to the representative dental organization of any of the territorial possessions of the United States. Dentists residing in the City of Washington, or in the District of Columbia, may apply for membership in the National Dental Association only through the Maryland State Dental Society.

ARTICLE V.—*The House of Delegates.*

SECTION 1.—There shall be a business body known as the House of Delegates of the National Dental Association. It shall consist of delegates elected by the Constituent Associations, and by the other dental bodies named in Section 2 of this article. The House of Delegates shall represent the delegated powers of the members of the National Dental Association, and shall be the national representative body of the Constituent Associations. It shall elect the general officers of the Association and a board of nine trustees, and shall transact all the business of the Association, public, professional, or scientific, not otherwise provided for. The trustees shall be members of the House of Delegates, without the right to vote.



SECTION 2.—The total voting membership in the House of Delegates (exclusive of the Board of Trustees) shall not exceed one hundred and fifty, but may be less if equitable apportionment should demand. One delegate shall be allowed from each scientific section, and from each of the following: American Society of Orthodontists, National Association of Dental Faculties, National Association of Dental Pedagogics, National Association of Dental Examiners, the Army Dental Corps, and the Naval Dental Corps (when established); and the remainder shall be apportioned among the Constituent Associations, as hereinafter provided in the By-Laws.

ARTICLE VI.—*Sections.*

SECTION 1.—This Association shall be divided into three sections, as follows:

Section I shall have charge of operative dentistry, nomenclature, literature, dental education and allied subjects.

Section II shall have charge of oral surgery, anatomy, physiology, histology, pathology, etiology, hygiene, prophylaxis, materia medica and allied subjects.

Section III shall have charge of prosthodontia, orthodontia, metallurgy, chemistry and allied subjects.

SECTION 2.—New sections may be created, or existing sections discontinued or modified by the House of Delegates.

ARTICLE VII.—*Branches.*

The House of Delegates may create such branch organizations as may be deemed essential to the welfare of the National Dental Association and of the dental profession.

ARTICLE VIII.—*Annual Sessions.*

The National Dental Association shall hold an annual session at the time and place chosen by the House of Delegates. The time and place for the session, however, may be changed by the unanimous vote of the Board of Trustees, but not later than sixty days prior to the time selected for the session.

ARTICLE IX.—*Officers.*

SECTION 1.—The general officers of the Association shall be a president, four vice-presidents, a general secretary, a recording secretary, and a treasurer.

SECTION 2.—These officers shall be elected annually, by the House of Delegates, to serve for one year, or until their successors shall have been elected and installed.

SECTION 3.—No member of the House of Delegates shall be eligible to the office of president or vice-president.



ITEMS OF INTEREST

ARTICLE X.—*Board of Trustees.*

SECTION 1.—The Board of Trustees shall have charge of the property and of the financial affairs of the Association.

SECTION 2.—Three trustees shall be elected annually by the House of Delegates, each to serve for a period of three years.

SECTION 3.—No voting member of the House of Delegates shall be eligible to election on the Board of Trustees, but the Board of Trustees after election shall be members of the House of Delegates, without the right to vote.

ARTICLE XI.—*Dues and Assessments.*

SECTION 1.—The annual dues in this Association shall be five dollars.

SECTION 2.—Members of the Army and Navy Dental Corps may be elected to full membership, with all privileges, without payment of dues.

SECTION 3.—In case of need, in order to raise funds, the House of Delegates may order an assessment not to exceed five dollars in one year, for each member; or an assessment not to exceed fifty dollars in one year upon each Constituent Association, but not both.

ARTICLE XII.—*Amendments.*

The House of Delegates may amend or alter this Constitution at any annual session, due notice having been given at a previous meeting of said annual session, provided unanimous consent may be obtained. Otherwise all amendments must lie on the table until the annual session next following their introduction, at which time a two-thirds vote will be requisite for their adoption. In the latter procedure due notice of the substance, or if not too lengthy, the exact wording of the proposed changes must be sent to each member of the House of Delegates with the regular notice of the annual session.

By-Laws.

Book I. Membership.

CHAPTER I.—*Qualification for Active Membership.*

SECTION 1.—A member in good standing of a Constituent Association shall be eligible for membership in the National Dental Association on presentation to the general secretary of the following: (1) Satisfactory evidence of the above qualification; (2) written application for membership on the prescribed form; (3) the annual dues.

SECTION 2.—Members of the Army and Navy Corps may become members in the manner described in Section 1, except that they shall not be required to pay dues, but they shall not receive the Journal of this Association except by personal subscription.



SECTION 3.—Members must retain their membership in Constituent Associations. Upon official notification from a Constituent Association that a member has lost this qualification, the secretaries will erase the delinquent's name from the roll of membership of this Association, and notify him of this action, stating the reason therefor.

SECTION 4.—A dentist who has forfeited his membership in accordance with Section 3 shall be reinstated on his request by the general secretary, on presentation of satisfactory evidence that his qualification has been restored by the Constituent Association.

SECTION 5.—Any member who shall fail to pay his annual dues for one year, unless absent from the country, shall be dropped from the roll of members, provided that due notice shall be previously given to the member by the general secretary. Any member who has been suspended for non-payment of dues shall be restored only when all his dues have been paid.

CHAPTER II.—*Registration.*

SECTION 1.—No member shall take part in the proceedings of the Association or of any of the Sections until he has registered his name and address with the proper officer or committee and has paid his annual dues for the current year.

SECTION 2.—A member desiring to take part in the scientific work of the Association shall indicate, when registering, the section in which he wishes to be enrolled.

CHAPTER III.—*Delegated Members, Honorary Members, Associate Members, etc.*

SECTION 1.—Members delegated to the House of Delegates by the American Society of Orthodontists, the National Association of Dental Faculties, the National Association of Dental Pedagogics, and the National Association of Dental Examiners, shall register and pay their annual dues, thus qualifying as members of this Association, before taking their seats in the House of Delegates.

SECTION 2.—Dentists who have arisen to pre-eminence in foreign countries shall be eligible to honorary membership. They may be elected by the House of Delegates on nomination by a Section, but not more than three honorary members shall be elected in any one year.

SECTION 3.—Associate membership may be granted by the House of Delegates to distinguished visitors. Such membership accords all privileges for one year, including the Journal of the Association.

SECTION 4.—Membership of all classes may be declared forfeited by the House of Delegates for reasons considered sufficient by that body.



Book II. Delegates.

CHAPTER IV.—*Qualifications, Term, Apportionment and Registration of Delegates.*

SECTION 1.—No one shall serve as a member of the House of Delegates who has not been a member of this Association for at least two years, except delegates from the bodies named in Section 1 of Chapter III.

SECTION 2.—Delegates appointed by the bodies named in Section 1, Chapter III, and those from the Corps of the Army and Navy shall serve for one year, as also shall the delegates elected by the Sections. Delegates from Constituent Associations shall be elected for two years, and those Associations entitled to two or more delegates are requested to so elect that one-half of their quota may be appointed each year.

SECTION 3.—Upon the adoption of this Constitution a committee on apportionment shall be appointed, consisting of the newly elected president, the general secretary, and five others, and every third year thereafter the House of Delegates shall appoint a similar committee. It shall be the duty of this committee to examine the membership roll of all Constituent Associations, and to arrange a numerical basis upon which the equitable representation in the House of Delegates may be apportioned, and by this means determine the number of delegates to which each Constituent Association shall be entitled for the succeeding three years, and this basis of representation and allotment of delegates shall prevail until the next triennial apportionment.

SECTION 4.—Every delegate must present his credentials and be duly registered by the general secretary, or other designated officer or committee, before taking part in the business of the House of Delegates. Credentials shall include a certificate duly signed by the proper officials of the body delegating him, and such other evidence as may be required.

CHAPTER V.—*Procedure of House of Delegates.*

SECTION 1.—*Order of Business.*—The following shall be the order of business unless changed by unanimous consent:

1. Call to order by the president.
2. Roll call.
3. Reading and adoption of minutes.
4. Reports of officers.
5. Reports of committees.
6. Unfinished business.
7. New business.

SECTION 2.—No new business shall be introduced into the House of Delegates on the last day of the annual session unless with unanimous consent; and such new business, whether in the form of a resolution, memorial or otherwise, shall require a unanimous vote for final action.

SECTION 3.—The House of Delegates shall be governed by Roberts' Rules of Order, when not in conflict with these By-Laws or with the rules of the House.



SECTION 4.—Twenty voting members of the House of Delegates shall constitute a quorum for the transaction of business.

CHAPTER VI.—*Meetings of the House of Delegates.*

SECTION 1.—The House of Delegates shall meet annually on the day preceding the opening of, and at the same place as, the annual session of the Association.

SECTION 2.—Special sessions of the House of Delegates shall be called by the president, on written request of a sufficient number of delegates to represent a majority of the Constituent Associations, by mailing a written or printed notice to the last known address of each delegate, at least twenty days before such special session is to be held, in which shall be specified the time and place of meeting and in general terms the objects of such special session, and no other business shall be transacted thereat. The time and place for the meeting of a special session must be given in the requests signed by the delegates.

CHAPTER VII.—*Nomination, Election and Installation of Officers, Trustees, Honorary Members, Associate Members, etc.*

SECTION 1.—Nominations for office, except that of treasurer, shall be made orally, but no nominating speech shall exceed two minutes in length. Any nominee receiving the majority of the votes cast shall be declared elected. The treasurer shall be nominated by the Board of Trustees, who shall present two names.

SECTION 2.—All elections shall be by ballot, and a majority of the votes cast shall be necessary to elect. In case no nominee receives a majority of the votes on the first ballot the nominee receiving the least number of votes shall be dropped, and a new ballot held. This procedure shall be continued until one of the nominees receives a majority of all votes cast, when he shall be declared elected.

SECTION 3.—The election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the afternoon of the third day of the annual session.

SECTION 4.—Nominations for honorary membership from the Sections shall be referred without debate to the Committee on Sections and Section Work, which shall consider the relative scientific attainments and professional character of the nominees, and shall report its conclusions to the House of Delegates for action. The election of honorary members shall immediately follow the election of officers.

SECTION 5.—Nominations for associate memberships may be made by the Sections at any meeting of the House of Delegates, and may be confirmed, with or without reference to the Committee on Sections and Section work, at the will of the majority of the House of Delegates.

SECTION 6.—The general officers of the Association shall be installed at the close of the last meeting of the annual session, at which they are elected.



Book III.

CHAPTER VIII.—*Officers, Trustees and Committees.*

SECTION 1.—*President.*—The president shall preside at the general meeting and at the meetings of the House of Delegates, and shall perform such duties as custom and parliamentary usage require. On the morning of the first day of the annual session following his election he shall deliver an address at the general meeting not exceeding forty minutes in length.

SECTION 2.—*Vice-Presidents.*—The vice-presidents shall assist the president. During his absence or at his request one of them shall officiate in his place. In case of the death, resignation or removal of the president, the vacancy shall be filled by the ranking vice-president.

SECTION 3.—*General Secretary.*—The general secretary shall give due notice of the time and place of all annual and special sessions of the Association and of the House of Delegates, by publishing the same in the Journal of the National Dental Association and other journals. He shall notify members of committees of their appointment, and of the duties assigned to them. It shall be his duty to verify the credentials of members of the House of Delegates and to provide a registration book for them, in which shall be recorded the name of each delegate in attendance at each session. He shall conduct all correspondence required of him by the Association or by the House of Delegates, or which may become necessary in the rightful conduct of his office.

SECTION 4.—*Recording Secretary.*—The recording secretary shall keep in separate books the minutes of the general meetings and of the House of Delegates. He shall prepare a roll of the delegates attending each session to facilitate voting by roll call. He shall prepare for publication the official programme of each session, and shall perform such other duties as may be directed by the Association or by the House of Delegates.

SECTION 5.—*Treasurer.*—The treasurer shall be the custodian of all moneys, securities and deeds belonging to the Association, and shall hold the same subject to the direction of the Board of Trustees. He shall give to the Board of Trustees a suitable bond, and shall receive a salary to be fixed by the Board of Trustees.

CHAPTER IX.—*Board of Trustees.*

SECTION 1.—The Board of Trustees shall have charge of all properties and of the financial affairs of the Association. At the first meeting of the Board after the annual session of the Association it shall organize. In addition to the nine elected members of the Board of Trustees, the president and general secretary shall be *ex-officio* members and shall hold the same positions in the Board as in the Association, but the Board shall elect a recording secretary, who shall keep its records and make its reports.

SECTION 2.—*Journal.*—It shall be the duty of the Board of Trustees to provide for and superintend the publication of the Journal of the



National Dental Association, and of all proceedings, transactions, and memoirs of the Association. It shall have full discretionary power to omit from the Journal of the National Dental Association, in part or in whole, any paper that may be referred to it by any of the Sections. It shall appoint a general manager and an editor of the Journal, which two positions may be held by one person, and such assistants as may be necessary, and shall determine their salaries and the terms and conditions of their employment.

SECTION 3.—*Meetings During Annual Sessions.*—During the annual session of the Association the Board shall hold meetings as often as may be deemed necessary by the president, and all matters referred to it by the House of Delegates shall be reported on within twenty-four hours, if so ordered by the House.

SECTION 4.—*Board Reports.*—The Board of Trustees shall have the accounts of the treasurer and of the Journal office audited annually, or oftener if deemed necessary, and shall make an annual report on the same to the House of Delegates, which report shall also specify the character and cost of all the publications of the Association during the year and the amount of all property belonging to the Association.

SECTION 5.—*Vacancies.*—In case of vacancy in the office of treasurer or Board secretary, the vacancy shall be filled by the Board of Trustees.

SECTION 6.—*Salaries.*—The Board of Trustees shall fix the salaries of the treasurer, the general secretary, the recording secretary, the Board secretary, and of the Journal manager and the editor.

SECTION 7.—*Regular Meetings of Board.*—Regular meetings of the Board of Trustees shall be held immediately after the annual session of the Association and at the same place, and on the first Monday in the month of February, of each year, at such place as the Board may select at its first meeting.

SECTION 8.—*Special Meetings of Board.*—Special meetings of the Board of Trustees may be called at any time by the president, or by request of five members of the Board, due notice of which must be given to each member of the Board at least five days in advance of the meeting. The general object of a special meeting must be stated in the notice, and no other business may be transacted.

SECTION 9.—*Annual Sessions, Exhibits, Clinics and General Arrangements.*—The Board of Trustees shall have full control of all arrangements for the annual sessions, and shall provide meeting places for the Association, the House of Delegates, and the various Sections. It shall also have control of all clinics and of all exhibits. The Board of Trustees in their discretion may appoint a local committee of arrangements, which shall at all times be under the control of the Board of Trustees.

CHAPTER X.—*Committees.*

SECTION 1.—Committees shall be classified as (a) standing committees, (b) reference committees, (c) special committees. These committees shall be nominated by the president and elected by the House of Delegates, unless otherwise provided.

ITEMS OF INTEREST

SECTION 2.—*Committees, Appointment and Powers.*—Reference committees shall be nominated from among the House of Delegates, but any member of the Association shall be eligible to serve on standing or special committees. All members of committees who are not members of the House of Delegates shall have the right to present their reports in person to the House of Delegates, and to participate in the debate thereon, but shall not have the right to vote.

SECTION 3.—*Standing Committees.*—Standing committees shall be as follows:

- (a) A Judicial Council.
- (b) A Committee on Dental Education.
- (c) A Committee on Dental Legislation.
- (d) A Committee on Transportation and Place of Session.

SECTION 4.—*Judicial Council.*—The Judicial Council shall be composed of five members to be appointed by the president on the first day of each annual session from the delegates present, and to continue in office until their successors are appointed. It shall organize by electing a chairman and a secretary. The latter shall keep a permanent record of its proceedings, shall conduct all correspondence, etc. The Judicial Council shall hold such meetings during the annual session, and during the year, as it may deem necessary. Three members shall constitute a quorum. It shall make an annual report of its proceedings to the House of Delegates. To this Council shall be referred all questions, complaints, protests, and matters of an ethical nature. When such complaints, protests, etc., concern an individual's relations with his local or State society, they shall be considered by this Council only after the same shall have been referred to the Constituent Association concerned, or on an appeal from such Constituent Association. Its decisions shall be subject to appeal to the House of Delegates.

SECTION 5.—*Committee on Dental Education.*—The Committee on Dental Education shall consist of five members. One member shall be elected to serve one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member shall be elected each year to serve five years. The committee shall organize, shall elect a chairman and secretary, and shall adopt such regulations for the government of its actions as it may deem expedient. It shall expend money or contract financial obligations only as shall be authorized in writing by the Board of Trustees. The functions of the Committee on Dental Education shall be: (1) To make an annual report to the House of Delegates on the existing conditions of Dental Education in the United States. (2) To make suggestions as to the means and methods by which the National Dental Association may best influence favorably dental education. (3) To act as the agent of the National Dental Association under instructions of the House of Delegates in its efforts to elevate the standards of dental education.

SECTION 6.—*Committee on Dental Legislation.*—The Committee on Dental Legislation shall consist of five members. One member shall be elected for one year, one for two years, one for three years, one for four years, and one for five years. Thereafter one member shall be elected



each year to serve for five years. The committee shall organize, shall elect a chairman and secretary, and shall adopt such regulations for the government of its actions as it may deem expedient. It shall expend money or contract financial obligations only as shall be authorized in writing by the Board of Trustees. This committee shall have the authority to appoint a sub-committee, consisting of one member from each Constituent Association, and shall have the power to co-operate with the officers of the State and local societies, and with the chief officers of the United States Army and Navy in regard to legislation affecting the welfare of dentistry. The Committee on Dental Legislation shall report to the House of Delegates at each annual session its proceedings during the previous year, and shall recommend such action in respect to pending legislation as it shall deem proper.

SECTION 7.—*Committee on Transportation and Place of Session.*—The Committee on Transportation and Place of Sessions shall consist of five members. The chairman shall be elected to serve for three years; the other four members shall be appointed by the president annually, one of whom shall reside in the place chosen for the next annual session. Invitation for the Association to convene in any city or place shall be presented to this committee, whose duty it shall be to recommend to the House of Delegates the places available for an annual session, with advantages and disadvantages of each. The committee shall secure railroad rates for the annual session, and shall publish same in the Journal of the National Dental Association, and other journals, at the earliest possible time prior to the date of the annual session.

SECTION 8.—*Reports of Standing Committees.*—The reports of standing committees shall, as far as possible, be transmitted to the general secretary ten days before the date of the annual session, and he shall have them printed for distribution to members of the House of Delegates at the first meeting of the annual session.

SECTION 9.—*Reference Committees.* (a) Immediately after the organization of the House of Delegates, at each annual session, the president shall appoint from among its members such committees as may be deemed expedient by the House of Delegates. Each committee shall consist of five members unless otherwise provided, the chairman to be specified by the president. The members of these committees shall serve during the session at which they are appointed.

(b) To the appropriate committee shall be referred resolutions, measures, and propositions presented to the House of Delegates before final action shall be taken, unless otherwise unanimously ordered by the House of Delegates.

(c) Each reference committee shall, as soon as possible after the adjournment of each meeting, or during the meeting, if necessary, take up and consider such business as may have been referred to it, and shall report on the same at the next meeting, or when called on to do so. Three members shall constitute a quorum.

(d) The following reference committees are hereby provided:

1. A Committee on Sections and Section Work, to which shall be referred all business relating to the Sections.

ITEMS OF INTEREST

2. A Committee on Rules and Order of Business, to which shall be referred all matters regarding rules governing the action, methods of procedure and order of business of the House of Delegates.

3. A Committee on Dental Education, to which shall be referred all matters relating to dental colleges and dental education. The members of the standing Committee on Dental Education shall be *ex-officio* members of this reference committee.

4. A Committee on Legislation, to which shall be referred all matters relating to State and national legislation. The members of the standing Committee on Dental Legislation shall be *ex-officio* members of this reference committee.

5. A Committee on Amendments to the Constitution and By-Laws, to which shall be referred all business relating to this subject.

6. A Committee on Reports of Officers, to which shall be referred the president's address and the secretaries' and trustees' reports.

7. A Committee on Credentials, to which shall be referred all questions regarding the registration and the credentials of delegates.

8. A Committee on Miscellaneous Business, to which shall be referred all business not otherwise disposed of.

Book TU.

CHAPTER XI.—*General Meetings.*

SECTION 1.—*Time of General Meetings.*—The general meetings shall be held at 10.30 A. M. and at 8 P. M. of the first day of the annual session, and at 8 P. M. of the subsequent days.

SECTION 2.—*Addresses.*—At the first general meeting shall be delivered the address of the president, whose recommendations shall thereon go to the House of Delegates for action. The balance of the time of the first meeting shall be devoted to such other addresses as may be provided. The first evening meeting shall be devoted to a paper recommended by Section 1, the second evening meeting to a paper recommended by Section 2, and the third evening meeting to a paper recommended by Section 3.

SECTION 3.—*Order of Business.*—The order of the first general meeting shall be as follows:

1. Calling the meeting to order.
2. Prayer.
3. Address of Welcome and Response.
4. Report of Committee of Arrangements.
5. President's annual address.
6. Discussion of president's address.
7. Adjournment.

CHAPTER XII.—*Sections.*

SECTION 1.—*Meetings.*—Each section shall hold its first meeting at 2 P. M. of the first day of the annual session, and on each subsequent



day at 9 A. M., until the programme is completed or as the Section may decide; provided that a Section shall hold no meeting that will conflict with a general meeting.

SECTION 2.—*Officers of Sections.*—The officers of each Section shall consist of a chairman, vice-chairman and a secretary. These shall serve for one year, or until their successors are elected and qualify; provided that each Section may elect its secretary to serve a longer time at its discretion. Each Section shall also elect annually one representative and an alternate to the House of Delegates of the National Dental Association, to serve for one year.

SECTION 3.—*Election of Officers.*—The election of officers of each Section shall be the first order of business of the morning meeting of the last day of each annual session.

SECTION 4.—*Duties of Section Officers.*—(a) Each chairman shall perform the usual duties of such office, and shall co-operate with the Section secretary, in procuring papers and in the arrangement of the programme for his Section. (b) Each vice-chairman shall assist his chairman, and take his place when necessary. (c) Each secretary shall keep the records of the Section in a book provided for such purpose; shall, with the co-operation of the chairman, conduct all correspondence necessary to secure papers and perfect the programme for his Section; and he shall forward to the general secretary, at least thirty days prior to the date of the annual session, a copy of his Section programme for insertion in the official programme, and shall perform all other duties pertaining to the office of secretary.

SECTION 5.—*Executive Committee.*—Each Section shall have an Executive Committee, which shall consist of the last three retired chairmen. In the absence of a member of this committee the acting chairman shall sit in his stead. The Executive Committee shall examine and pass on all papers read before the Section, and shall indorse for publication only those that are of scientific or of practical value; it shall also examine all papers offered to the Section prior to the reading thereof, and shall choose the one to be read before the general meeting devoted to the work of its particular Section, and such paper shall not be read before the Section meeting.

SECTION 6.—*Honorary and Associate Members.*—Each Section, at its opening meeting, may make nominations for honorary and for associate members, in accordance with Sections 2 and 3 of Chapter III. The secretary shall immediately notify the general secretary of such nominations.

CHAPTER XIII.—*Papers and Discussions.*

SECTION 1.—Titles and abstracts of papers offered to Sections must be in the hands of the Section secretary at least thirty-five days prior to the annual session.

SECTION 2.—The time allowed for the presentation of a paper before a Section shall be limited to thirty minutes, except by unanimous con-

ITEMS OF INTEREST

sent. No one shall address a Section more than once on the same subject, nor for longer than five minutes, except with the consent of the majority of those present.

SECTION 3.—Each Section may provide by-laws for its own government, provided these by-laws do not conflict with the Constitution and By-Laws of the Association.

CHAPTER XIV.—*Publication.*

SECTION 1.—No paper shall be published as having been read before a Section unless it has received the approval of the Executive Committee of said Section.

SECTION 2.—Each author shall hand his manuscript to the Section secretary immediately after the reading thereof, and such manuscript must be ready for publication at that time, and must be accompanied by copy for all illustrations needed. The secretary shall indorse thereon that it has been read, and shall hand it to the Executive Committee for its action. All papers approved by the Executive Committee shall be returned to the Section secretary, who shall at once forward them for publication to the editor of the Journal.

SECTION 3.—No paper shall be published as having been read before a Section unless it has actually been read, or unless, for special reasons, when the author has been present and prepared to read the paper, the Section shall vote to have it read by title.

SECTION 4.—All papers and reports presented to a Section, and approved by the Executive Committee, shall become the exclusive property of the Association, provided that the Board of Trustees may permit an author to publish his paper elsewhere than in the Journal of the National Dental Association.

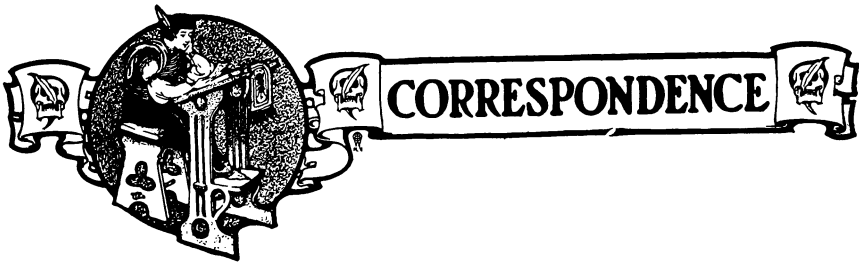
SECTION 5.—*Official Resolutions Approved by the House of Delegates.*—No memorial, resolution, or opinion of any character whatever shall be issued in the name of the National Dental Association, unless it shall have been approved by the House of Delegates.

Book U. Amendments.

CHAPTER XV.—*Articles of Incorporation.*

SECTION 1.—The House of Delegates at any annual session, wherever the same may be held, may instruct the Board of Trustees to make any changes in the articles of incorporation in accordance with the law, which may appear desirable or which may be made necessary, by any change or amendment to the Constitution and By-Laws of this Association.

SECTION 2.—These By-Laws may be amended on a two-thirds vote of the House of Delegates, provided that no amendment shall be acted on till the day following that on which it is introduced; except that the Board of Trustees may by unanimous vote make such changes, and such changes only as may be required to adapt them to the rules and regulations of the United States postal authorities.



Tin and Gold.

Editor ITEMS OF INTEREST.

My Dear Mr. Editor—From page 554 July issue I quote: "Tin and gold and hand pressure. If this method is so good why has it made so slight an impression upon the dental profession, considering that it has been preached and practiced for over a half of a century."

Now, why such a question! Is it not a well known fact that because a certain material or method of practice is not generally in vogue, it need not necessarily be condemned?

Tin and gold in combination (not necessarily "*and hand pressure*") have been used consistently by a sufficient number of successful operators who have seen it stand the test of time, to prove that it is no longer an experiment, and that it is not more generally used is to be regretted from the standpoint of the public.

Those who have used it and watched it for a quarter of a century or so, know full well that, when used where indicated, it has no equal for saving teeth. Those who have not used it successfully are in no position to judge of its value.

Inlays have been used sufficiently long to absolutely disprove the theory advanced by some, that decay would not recur about their margins.

The writer had the good fortune to be present at Niagara Falls in 1886 when Herr Herbst *introduced* the making of inlays from matrices to the dentists of this country, and has followed the practice in all its stages from that day to this.

But he does not believe that any system of inlays will ever entirely take the place of good *bona fide* old time gold, and gold and tin fillings.

He has gold fillings in his own teeth that were placed there about thirty-five years ago. And he frequently sees such fillings that have stood the stress of time for from forty to fifty years.

ITEMS OF INTEREST

The trouble with the inlay is that it compels the sacrifice of a needless amount of tooth structure—that is, when it is a fad of the operator and used where fillings are indicated.

The easiest thing to do in the dental world is to make a Taggart inlay—I mean, of course, a poor one. Good inlays are usually very difficult propositions, and frequently more so than would be fillings in the same cases.

So please do not decry “tin and gold,” even though you use Taggart inlays where the other material has long since demonstrated its value.

Respectfully,

C. EDMUND KELLS.

Correction.

Editor ITEMS OF INTEREST.

Dear Doctor—Will you kindly let me go on record in the ITEMS OF INTEREST as correcting a statement made at the C. D. A. and appearing in the July number, page 547.


“Carborundum is excellent for cutting porcelain; but for gold inlays I find the emery wheel much better, or the wheels that the S. S. White Co. sell as carborundum, which as a matter of fact are not.” I was misinformed, and regret my error. I was lead to make this statement by a worker in abrasive powders and stones, who had examined the wheels side by side with the light green product trade marked “Carborundum” and marketed by Lee Smith & Son.

The similarity of S. S. White Company’s wheels to emery in their physical qualities was strongly marked in the fact that they readily gave up their grit by disintegration, and only on close examination of their residue is the difference in material seen: for the S. S. White wheels in disintegrating give up whole granules, while emery wheels give fractured particles of crystal.

What I sought to show in my discussion was the field in which each of these stones would give the best results. I wanted to emphasize that a wheel which readily gives up its grit is superior for metal work to one that fails to and glazes.

Very sincerely,

F. H. NIES.



SOCIETY ANNOUNCEMENTS

National Society Meetings.

American Society of Orthodontists, Wash-
ington, D. C., November 2, 3, 4, 1908.

State Society Meetings.

Ohio State Dental Society, December, 1908.

Southern Illinois Dental Society, Greenville, Ill., October 27, 1908.

Missouri State Dental Association.

At the forty-third annual meeting of the Missouri State Dental Association held at the Planter's Hotel, St. Louis, the following officers were elected for the ensuing year:

President, J. B. McBride, Springfield; first vice-president, R. E. Darby, Springfield; second vice-president, E. P. Dameron, St. Louis; recording secretary, H. H. Sullivan, Kansas City; corresponding secretary, J. F. Wallace, Canton; treasurer, J. T. Fry, Moberly

Meeting of 1909 to be held at Kansas City.

J. F. WALLACE, Corresponding Secretary.



Illinois State Dental Society.

At the forty-fifth annual meeting of the Illinois State Dental Society the following officers were elected for 1908-1909:

President, Arthur D. Black, 31 Washington Street, Chicago; vice-president, E. F. Hazell, Springfield; secretary, R. J. Hood, Sparta; treasurer, C. P. Pruyn, 92 State Street, Chicago; librarian, J. T. Cummins, Metropolis City.

The 1909 meeting of the society will be held at Danville, May 11, 12, 13, 14.

R. J. Hood, Secretary.

The Northern Dental Association.

The Northern Dental Association has been organized for the purpose of advancing dental education and cultivating sociability among our fellow practitioners.

At the first regular meeting of the newly born association, held Thursday, May 28, at 1666 Madison Avenue, New York, a constitution, by-laws and a code of ethics were adopted.

The following officers were elected: John L. Kaufman, president; J. M. Schwartz, vice president; Jonas S. Greenberg, recording secretary; M. L. Pollinger, treasurer; Wm. N. Sum, corresponding secretary; Isidor Berger, editor.

The president appointed the various committees to carry on the work of the organization.

The meeting then, after a lively and interesting discussion, adjourned.

At the meeting held June 25th, Dr. S. Daskow read a paper entitled: "Preparation of Roots and Crowning Anterior Teeth." The splendid paper aroused great interest and the discussion which followed lasted almost until midnight, thus enabling the members to cover the subject thoroughly. On a motion a hearty vote of thanks was tendered to Dr. Daskow for his excellent paper and the meeting adjourned.

All ethical dentists are invited to join this association and are requested to communicate with Wm. N. Sum, secretary, 1477 Washington Avenue, Bronx, N. Y.